

# The United States MILLER

AND THE MILLING ENGINEER.

Sixteenth Year.—No. 4.

MILWAUKEE, APRIL, 1891.

Subscription Price, \$1.00 Per Year.

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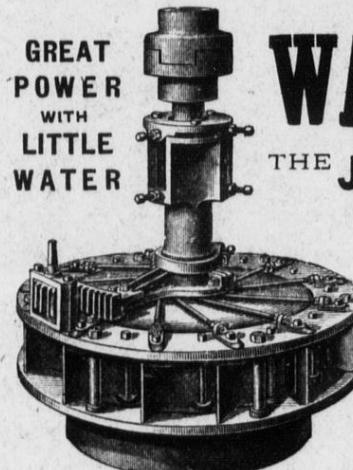
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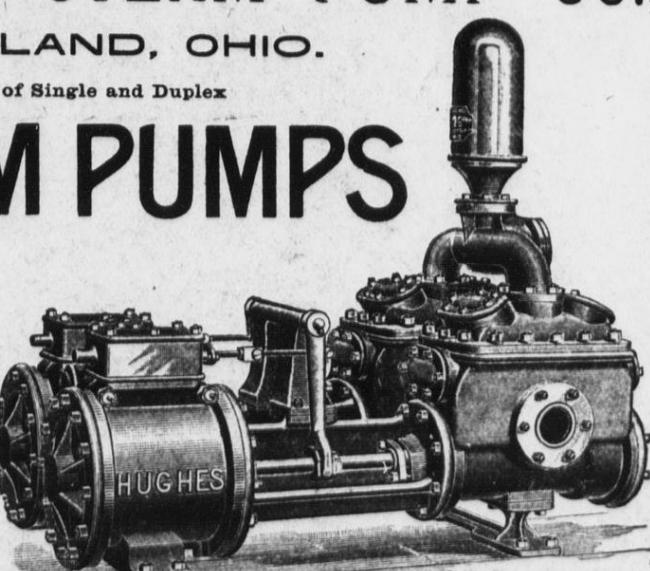
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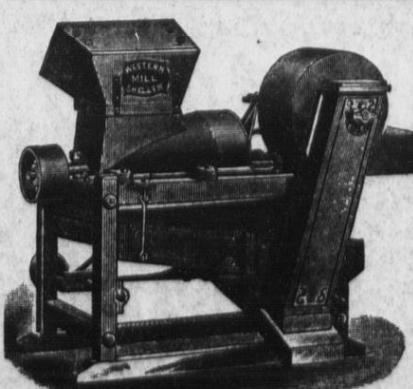
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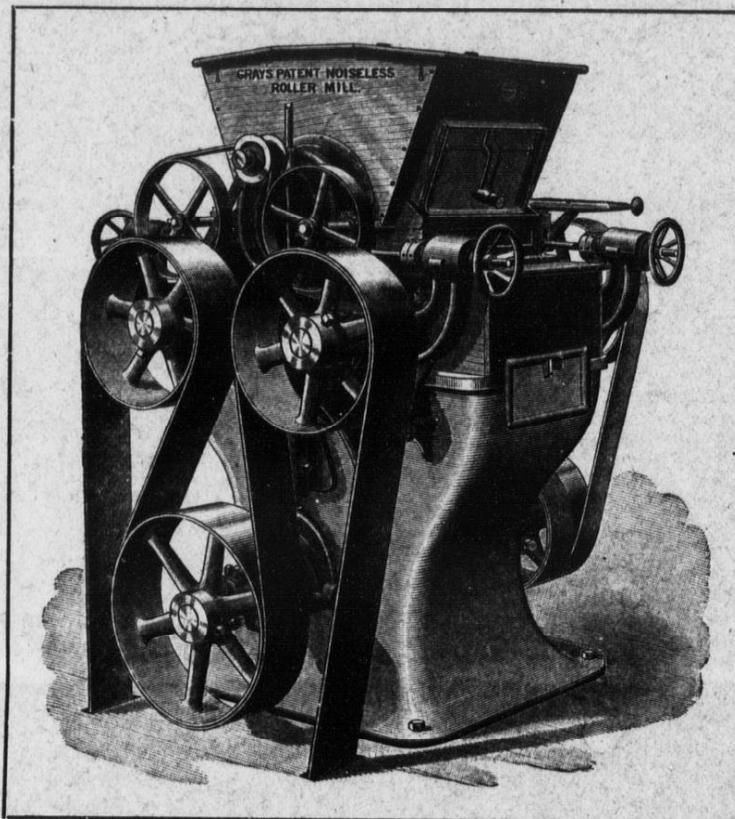
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MILWAUKEE, WIS.

# The United States

# MILLER

AND THE MILLING ENGINEER.

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[Written for the UNITED STATES MILLER.]

## THE BEST FLOUR.

By JOSEPH LACROIX.

What is to be understood by good flour—

Is it that which gives the most bread?

Is it that which makes it the most palatable?

Is it that which makes the whitest bread?

Or is it the flour which makes the most nourishing bread?

I shall endeavor to answer these questions in the most precise manner.

1st, Is the flour that gives the most bread the best? *Gluten.* There is a notion amongst millers that flour containing the most gluten makes the most bread. It is wrong, because bread made with pure gluten, or that made for people suffering from diabetes is as light as soap bubbles, it hardly retains any water; and the flour it has been taken from absorbs and retains a large quantity of it. Then it is not gluten but starch that absorbs and retains water.

Gluten, besides its chemical qualities also performs a physical part in bread. It builds it up, gives it volume and lightness.

White flour made of purified middlings contains more gluten and therefore takes less water and makes less bread than break flour, with the middlings out, but it has more body and lightness, which is an advantage if bread is sold by its bulk. The poorer the flour in gluten the more water it takes and the more bread it makes in weight.

Flour that does not contain a sufficient quantity of gluten, or in which the gluten has not enough elasticity, as it is the case with flour made from wheat raised on poor ground, in shady valleys or harvested before sufficient maturity, would only make flat bread, with small pores, giving a large surface in the oven, and giving but a small quantity of bread. The small quantity or bad quality of the gluten in flour whose tenacity is weakened by its fermentation, causes it to make bad heavy and indigestible bread. It produces less than 127½ per cent of bread, which which percentage is considered the best. Flour made with too light wheat gives the same result.

A good patent or straight flour ought to give 127½ lbs. of bread to 100 lbs. of flour. All flour that produces more bread than that makes it more watery and consequently less nourishing. All flour that produces less than 127½% of bread comes from an inferior quality of wheat in which the gluten is too slender or in too small quantity, and in which the starch is not sufficiently ripe; the bread from such wheat is not very nourishing.

We must then conclude that the best flour is not that which gives the most nor the least of bread, but the one that gives as nearly as possible 127½ per cent of bread.

2d, Is the flour that makes the sweetest bread the best? *Sweetness.* The germ of wheat contains the greater part of its es-

sential oil, about 12 per cent. The more aromatic oil the white flour contains the better the bread it makes. Ripe wheat contains the most. Thus it is essential to good taste in bread that it should be made from flour containing the largest possible quantity of aromatic oil. Still in grinding, and especially in roller grinding, the germ is eliminated, its fatty and glutinous nature now allowing it without much difficulty to be ground into flour except for a very small part, and it finds its way almost completely into the inferior products of the mill. It is only in low or close grinding that some of it will find its way into the flour; and generally in the lower grades. This explains the quality of some low grades of flour.

Thus it would seem that flour containing the most germ should have the most agreeable flavor, but such flavor is partly annulled by that given to it by the cerealeine contained in flour made from a low grade of middlings, at the tail end of the mill, in the proportion of 4 to 5 per cent, such as that made by low and coarse grinding, or when a sufficient quantity of low grades is not taken out. The grinding with rollers, and especially that by the long system eliminates the whole or very nearly the whole of the germ, and the flour coming from such grinding contains only the essential oil of the internal covering of the wheat.

Flour may lose some of its good flavor and become more or less acid by undergoing a commencement of fermentation. Panification will be difficult and the good taste diminishes without getting musty; its oils concrete it and it loses its liveliness; bread made from it has no more masticating property, as connoisseurs express it.

Thus we must conclude that good taste in bread is partly due to the good quality of the flour it is made from, and partly to the manner of manufacturing it.

3d, Is the flour that makes the whitest bread the best? *Whiteness.* Very white flour may be made from light wheat by leaving the white middlings in it, and throwing off the dark ones. Such flour, especially if it comes from tender or soft wheat, is deceiving to buyers, and the bread made from it is of inferior quality, whatever its appearances may be. To guard themselves against such deceiving appearances, buyers need all their theoretical as well as practical knowledge and experience. Such flour should never be used without being mixed with stronger and superior flour.

Thus the whiteness of flour is not always a certain proof of its good quality. It is only a doubtful indication of its being such.

A baker wishing to do a paying business must try to satisfy the public amongst whom he exercises his trade, whatever he may think and whatever may be his opinion of the best bread. To redress a public error would necessitate a long lapse of years, and the manufacturer who would undertake to correct the

errors of his customers would soon see them get away from him.

Between the two kinds of food the consumer very seldom chooses the most nourishing, but the one whose flavor suits him the best, such as white instead of dark bread. The public thinks that dark bread may be very nourishing and good. He likes to eat it once in a while, but for his daily consumption he prefers white bread. It is more agreeable to his taste and to his sight. The baker has to satisfy his customers, although bread made with any other flour than the one he uses might be more nourishing.

To our daily acquisition of food we pay less attention to what is nourishing than what suits our taste. We care more for the variety that will render our meals agreeable, taste being that one of our five senses we are most anxious to satisfy. We must then conclude that a baker is bound to satisfy his public and that the best flour for him is not the one which makes the most nonnourishing bread, but that makes the bread his customers prefer, and which he is bound to furnish them.

But if we ask a scientific and intelligent baker which is the flour he prefers for his own use, he will answer: It is the one that makes as nearly as possible 127½ lbs. of bread to 100 lbs. of flour. It makes the most savory as well as the most nourishing bread.

## STEAM BOILER INSURANCE.

**W**HEN the principle of boiler insurance was first broached on this continent, in 1886, the risk was limited to the actual damage done to the boiler itself. In other words, boiler insurance insured only the value of the boiler. All other losses arising from the explosion were upon the unfortunate owner; so that he received possibly only a few hundreds in compensation for an explosion which might cost him, directly or indirectly, many thousands of dollars. When the United States Supreme Court decided that steam boilers do not explode unless there is carelessness on the part of somebody (either in the way which they are operated or the manner in which they are made), and that the explosion itself is *prima facie* evidence of negligence, and one which renders the owner of the boiler liable for all loss by death, injury or damage to surrounding property, it was felt that the old policy was no longer adequate, and that there was room for a company which should insure the steam-user from all loss whatsoever arising from an accident to his boiler.

Given the need it was not long before companies were found ready to issue a blanket form of policy, covering every hazard of a boiler explosion, and paying not only for all loss to property and also indemnifying their policy-holders from all loss to life and injury to person, by paying \$5,000 for the death or total disability of any person and \$50 per week for fifteen months for any person tem-

porarily injured. In addition the newest policies recoup the owner of the boiler for loss he may sustain by the damage or stoppage of work consequent upon such an explosion.

It may be asked how can such a comprehensive policy be rendered remunerative? Simply by a vigorous inspection of the boiler before insurance, and by a careful supervision over it at intervals afterwards. Each company has on its staff skilled mechanical engineers, who enter the boiler itself and by application of the hammer test, ascertain beyond a peradventure its actual condition without straining or in any way weakening its structure. Except in the case of new boilers the hydrostatic test is never used; as it has been found that this test strains an old boiler far too much and that it is frequently the cause of explosions when steam is once generated. The gauges and appliances are carefully tested and corrected, the safety valve is set for the number of pounds allowed, and necessary alterations are suggested and improvements required are pointed out. The inspector leaves the boiler quite safe before he issues his certificate, and this, too, without unnecessary interference or cessation of work.

## A PROBLEM IN GRAIN TESTING.

The *Country Gentleman* prints the following letter from a farmer residing in Jefferson County, Ohio: "Recently, in talking with our grain dealer, a problem rose which I wish to lay before your readers. He had bought a few carloads of this year's wheat without using a tester, and as it was sold on the Pittsburg market and graded by a tester, he said he lost money. He then bought a tester, and has been using it ever since. He pays 90 cents for wheat that weighs 60 pounds per bushel. If it weighs but 59 pounds he takes 61 for 90 cents; if but 58 he takes 63, and 65 where the wheat weighs but 57 pounds per bushel. This, he says, is according to the rules laid down by the millers' association. They take the amount of flour made from a bushel of wheat weighing 60 pounds as a standard, and claims that it takes 61 pounds of wheat weighing 59 pounds to make an equal amount of flour, and 63 pounds of 58-pound wheat, etc.

There is no quarrel with this; but here comes a farmer with a bushel of wheat that weighs 62 pounds. How much should he receive by the same rule? The dealer tests it and says he will pay him 90 cents for the 60 pounds and 1½ cents for the extra 2 pounds, or 93 cents for the bushel. The farmer pockets the money with a satisfied air, but he has been cheated. I say that according to the millers' rule above mentioned 58 pounds of this wheat would make as much flour as the 60 of a standard bushel, and the farmer should have received 90 cents for the 58 pounds, plus the same rate for the extra 4 pounds, or over 96 cents for the bushel instead of 93 cents as paid by the dealer.



UNITED STATES MILLER  
AND THE MILLING ENGINEER.

E. HARRISON CAWKER, EDITOR.

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MILWAUKEE, APRIL, 1891.

We respectfully request our readers when they write to persons or firms advertising in this paper, to mention that their advertisement was seen in the UNITED STATES MILLER AND THE MILLING ENGINEER. You will thereby oblige not only this paper, but the advertisers.

THE Central Indiana Millers' Association will meet in Indianapolis, April 27.

A GREAT macaroni factory having been established in this country, the Italian war may now go on.

OUR May number will contain a report of the proceedings of The Millers' National Association, at their annual convention in New York.

OUR Buffalo correspondent furnishes the UNITED STATES MILLER with an unusually interesting letter this month. It will well repay a careful reading.

MAY 1, The Millers' Mutual Insurance Co. of Wisconsin will remove its headquarters to De Pere, Wis. E. W. Arndt is the Secretary of the Company.

THE Mechanical News, published by James Leffel & Co., New York City, has been changed in form and has a new dress of type. It looks very unfamiliar to its many old-time readers in its modernized form.

THE scheme of our eminent contemporary the Northwestern Miller to increase its subscription list by a voting contest, and that of the American Miller to accomplish the same result by its Life Subscription proposition are evidently "two of a kind."

STOCK insurance companies now seem to have the trade in insuring flouring mills. If they do not prove too grasping they may keep the business. Should they do otherwise however, the wheel of fortune will make another turn and bring the mutuals again to the front.

THE efforts to secure \$20,000 with which to start the Millers' League seems to be meeting with very slow success, and we cannot help but wonder at it. If \$20,000 was wanted to organize a base ball club, it could be raised "in a jiffy" in almost any of our large cities.

ANOTHER combination has been formed, or mutual understanding is said to have been arrived at among the oat-meal millers of the United States. Said millers met in Chicago recently, and are reported to have agreed to regulate production. The present prices will be maintained.

THE Centennial celebration of the establishment of the American Patent System was duly observed in Washington, D. C., April 10, 1891. It was inaugurated during the administration

of President Washington. We doubt if even the wisest of the law makers in those days realized what a tremendous part in the affairs of life the patent law was to take. There is no branch of human economy that has not been affected in some degree by our patent laws.

WE trust that there will be a very large attendance at the meeting of Millers' National Association to be held in New York next month. As we understand it, all millers intending to join the Association as well as the present members, are invited. The announcement by Secretary Barry in this issue gives full particulars.

AMONG the most important contributions to the export flour business the new Riverside Cable Code issued this year is doubtless the leader. Years of actual use of former codes have shown up the errors therein, and the present compilation is well nigh perfect. Copies can be obtained direct from the publishers, The Riverside Printing Co., Milwaukee, Wis.

SECRETARY REYNOLDS, of the Michigan Millers' Association, is always on the lookout for matters affecting the interests of Michigan millers. Recently he discovered that a Michigan legislator had introduced a bill to compel all millers owning water-power to put fish-ways in the dams. He concluded it was a dam outrage on Michigan millers, and went vigorously to work and succeeded in defeating the bill.

RECENT dispatch says that the new milling syndicate in Minneapolis is complete with the exception of the Crown Roller mill, and that will probably come in very soon. The new syndicate will be called the Northwestern Consolidated Milling Co. This announcement will not create any feelings of great satisfaction with owners of small mills. It now appears to be their turn to organize a syndicate of their own.

THE Commercial Record is the title of a new paper just issued at West Superior, Wis., "Devoted to the realty, grain, milling, shipping, lumber, manufacturing and railway interests."

If it attempts to faithfully cover all these interests, in the scope of one paper we think the publisher will soon realize that "he has bit off more than he can chew." The new candidate for public favor has a very presentable appearance and when it strikes its regular mission solely and entirely as a real-estate-boom organ, dedicated to West Superior interests, it will no doubt meet with a support from West Superior people which will fill the pockets of the publisher not only with good coin, but also with I. O. U's of indefinite value.

TO facilitate business it is highly desirable the various boards of trade in this country should have the advantage of direct connection by telegraph with each other. On this subject the Chicago Herald says:

The plan for building a telegraph system between the different exchanges of the country is almost in shape for presentation. But for the illness of certain members of the committee appointed to forward the matter, the plan and progress made toward perfecting it would now be ready for publication. Chairman D. E. Richardson of the committee appointed by the board of trade to present a plan for the building of such system, spoke of the progress his committee had made as follows: "The illness of Mr. Phelps, an active member of our commit-

tee, has somewhat delayed us, but nevertheless, if his recovery is speedy and if illness does not again interfere we shall very soon present our plan to the board of trade for adoption or rejection. I think that the lists will very soon be open. We have been agreeably surprised with the favor with which our advances have been met by the outside exchanges where we have had correspondence, but particularly gratified at the interest shown in our plan by trained investors who look at the venture from simply a money-making stand-point. It will probably surprise the majority of persons interested with us or against us to learn that the building of the line is assured; that it is now simply a question of how we want it built, and whether or not we wish it built for us or wish to build it ourselves. There are responsible people who stand ready to contract to build it for us under conditions. We are also rather gratified to find that the lines can be contracted for at less per mile or at less in the aggregate than we had counted upon. We have gone upon the theory that the best plan is for the exchanges to build it themselves and to keep the control of it themselves. The scheme contemplates lines between Boston, Philadelphia, Providence, New York, Buffalo, Albany, Detroit, Toledo, Chicago, St. Louis, Milwaukee, Minneapolis, St. Paul, Duluth, and such intervening cities as are convenient and profitable to take in. We have found that experts agree with us that the lines would be very profitable. The little line between Chicago and Milwaukee showed that the money-making part of the telegraphic business is between the commercial exchanges. That constitutes the bulk of the business. It furnishes the profits to the companies."

HON. CHARLES J. MURPHY, Special Agent of the U. S. Department of Agriculture, for the purpose of stimulating the use of Indian Corn in Europe, writes as follows:

"I am happy to inform you that I am repeating here the success I had in Edinburgh. Thus far I have brought my exhibit to the attention of three millions of people and have made many converts. Institutions and private families are adopting it in preference to oat-meal, and corn dainties come up smiling alongside Scotland's national porridge. Secretary Rusk has appointed me to draw up a report on the use of corn abroad, and I hope to be able to rouse our farmers to the necessity and feasibility of making known the food value of our national grain to the half-a-million of the Old World."

## M. N. A.

Special Notice.

THE fifteenth annual convention of The Millers' National Association will be held at The Produce Exchange, New York City, commencing Monday, May 11, 1891, at 1 o'clock P. M. sharp. It is hoped that every member who can possibly arrange to attend this meeting will do so, as there are important measures to be acted upon, which are of vital interest to every manufacturer of flour in the United States. The fact that this convention will be held in New York, which is the central flour market of our country and in near proximity to Boston and other leading eastern markets, together with the very low rate of railroad fare obtained, will doubtless enable many of our members to combine a business visit to their eastern agents and patrons with attendance upon this meeting, and it is believed that the convention will, therefore, be larger than usual. The railroad lines embraced within the Trunk Line, Central and Western Passenger Associations have all granted a special rate of one and one-third fare for the round trip, upon the certificate plan, provided the attendance from their territory shall exceed one hundred. This rate will be good going on May 8, 9 and 10, and to return until May 16.

Request has been made by the committee of the Produce Exchange that we inform them how many of our members will attend the convention. This can only be done by asking our members to kindly advise the Secretary at the earliest moment possible whether they may be expected. Will you please do this? Respectfully,

When purchasing your tickets, you pay full first class fare going, and obtain from the agent of whom you buy your ticket, a certificate, which when countersigned by the Secretary of The Millers' National Association at New York, will enable you to obtain your return ticket over the same route at *one-third of the rate paid going*. It is important that every delegate should have one of these certificates, and before it can be countersigned for the reduced rate returning, guarantee must be given, that the ticket thus purchased will not be sold to "ticket scalpers," but will be used by the holder of the certificate. On Wednesday, May 13th, a party of millers, comprising probably 50 or more of our members, will sail by the Inman Line Steamship, City of New York, for a visit to the British flour markets. The Minneapolis and Northwestern delegation to the convention, with the European excursion party, have arranged to go east together, starting from Minneapolis via C. M. & St. P. Ry., Saturday, May 9th, at 6:10 P. M., arriving at Chicago, Sunday morning and leaving at 8 A. M. by the Lake Shore & Michigan Southern and New York Central Limited train, arriving in New York, Monday at 10:35 A. M. Special accommodations will be provided for the party, and any of our members desiring to join this train should write at once to C. K. Wilber, Western Passenger Agent L. S. & M. S. Ry., Chicago Ill., in order that proper accommodations may be provided, and sleeping car berths reserved.

The Hotel headquarters in New York City will be at The Imperial, corner of 32d Street, and Broadway. Ample accommodations will here be provided for the entertainment of those of our members who may desire to stop there while in the city. This hotel is conducted upon the European plan, the prices of rooms, without meals, ranging from \$2.00 per day, upward. It is a thoroughly fire-proof-building and is admirably located for convenience in reaching all parts of the city. A short block from the hotel is located the 33d Street Station of the 6th Ave. Elevated Ry., which carries one almost to the door of the Produce Exchange, near the Battery. The business headquarters will be located in the president's room of the Produce Exchange. The convention will be held in the call room, easily seating 500, the use of which together with freedom of the floor, library and committee rooms has been kindly tendered us by the management of the Exchange. A committee of 35 has been appointed by the Produce Exchange to receive and entertain our members while in New York and no pains will we spared, we are informed, to make the attendance of our members to this convention pleasant, as well as profitable from a business point of view.

The advantages of a trip to New York, under these conditions, should cause every member of our Association to make a special effort to attend and lend the support of his presence and counsel to the efforts that are being put forth toward strengthening and building up the National Association.

Request has been made by the committee of the Produce Exchange that we inform them how many of our members will attend the convention. This can only be done by asking our members to kindly advise the Secretary at the earliest moment possible whether they may be expected. Will you please do this? Respectfully,

FRANK BARRY,  
Milwaukee, April, 1891. Sec'y.

## CORRESPONDENCE.

[The following letters are all from our own special correspondents, and reflect their views and the views of the trade in the location from which they write.]

## OUR BUFFALO LETTER.

Railroad Encroachments — Grain Weighing Matters — Canal Freight and Duluth Wheat — A Reminiscence of '61 — Joke on an Old Member — Macaroni Factory — Thomas Ryan now Owner of the Clinton Mills — Merchants' Exchange Matters — Personal and Local Notes.

**A**S an illustration of the grasping disposition of railroads, the Lackawanna furnishes one of the best examples. This road came into Buffalo modestly, but soon commenced to stick out its feelers and before a year had gone by was the owner of a quarter of a mile of the best dock front in the city which included the old Board of Trade. Later on with the aid of a pious alderman and one not given to piety in any shape, secured Ohio and Water streets, the largest and most traveled thoroughfares in the city. These they ruined by placing the tracks so that it is impossible to use the road for any other purposes, except their own. Now they have purchased the block in which the tug offices are situated and this gives them the control of the foot of Main street, the only spot on the whole line of the dock where excursion boats can land and take on the enormous crowd of pleasure seekers. There will be a big fight against this powerful monopoly ere long and the people seem to have Uncle Sam on their side, as a suit has been brought against the company by that unrelenting old gentleman to oust them from the pier where they have built an enormous coal trestle on Government lands. We must either have the foot of Main street or the pier for public docks.

Mr. E. S. Richards, of Hopper-scale fame, has been in town the past month for the purpose of looking into the question of car grain transfers and establishing, if possible, some system whereby the charges of "short weight," so detrimental to the grain trade of Buffalo, can be prevented. As far as the elevators are concerned no fault can be found with them, as I stated in my last, although it is just these weights which are found to be wrong when the cars arrive at small towns, like Rochester for instance. The present move is to weigh all grain received from the West and instead of having Chicago or other public elevator weights, estimated weights, etc., etc., the grain will be transferred here under cover, weighed by Merchants' Exchange weighmaster and a certificate issued by him. The railroad agents here are anxious to have this scheme tried as they are as much interested as the grain merchants themselves. Mr. Richards is a hard worker and will push the matter to a final head if the receivers will give the necessary aid both in urging the Exchange to lend a helping hand and taking stock in the enterprise themselves.

Canal freights, which were just a humming a week ago, are now dead. Only Duluth stuff has been dealt in thus far, the amount taken being estimated at 700,000 bushels, the bulk of it for May shipment. The rates paid were 3½@4 cents for opening and 3½ for May. "Sid" Finn, the indomitable, is believed to have the largest share of this freight on hand and threatens to make things warm for all hands. I understand he claims to be "as happy as a clam at high tide" and thanks the UNITED STATES MILLER for giving him those words to roll under his tongue.

Sid is straight, and his friends hope he is right on these freights, but no matter what the result may be, you will find him on deck whether the rate be \$50 per boat against him or only one cent in his favor.

The stock of Duluth wheat here has dwindled down to 125,000 bushels of all grades. With a fair run of the rollers this will have disappeared by the 15th of this month. Latest reports from the straits are discouraging, being to the effect that the first of May is the earliest date upon which any reliance can be placed, as the ice is solid. Millers complain of a general dullness in their trade and huge stocks of flour, the Duluth and Minneapolis holdings being estimated at 25,000 bbls. in freight houses here. With this state of affairs it is no wonder that they view the present low stocks of wheat on hand with the utmost complacency. The country millers, however, look at it differently and are willing to take the wheat here, if holders will only come down off their high ideas as to its value. Sales were made to Rochester parties of round lots of No. 1 hard at \$1.21@1.22, No. 1 northern at \$1.19@1.20 and No. 2 northern at \$1.17. Buffalo millers seem to prefer selling what they own at these high prices and cannot see where their country cousins get the money back. If Minneapolis does not shove in its wheat at a little more rapid rate than in the past the hard wheat mills here will be closed before May 1st. Large amounts of c. i. f. No. 1 northern and a little No. 1 hard have been bought by the big millers.

Mr. George Urban, Jr., who is always unearthing something aged, produced from the innermost recesses of his capacious great-coat the other day an old bill for rye flour dating back to July, 1861, when that article was selling at \$1.75@2.00 per bbl. The shipment was one barrel short, and before a settlement could be made the battle of Bull Run had advanced the price to \$3.00 per bbl. The clerk then employed and whose signature appears on the bill was no other than Mr. Frank Fisk, now cashier of the Merchants' Bank of this city, whose salary was no doubt then in proportion to the price of rye flour, as compared with the \$5.00 now being paid.

The boys on 'change took it out of Mr. Guthrie the other day, not that there is any feeling against the gentleman named, but just a sort of a lesson to the old grumbler who are continually complaining about the temperature of the board room, which, to tell the truth, was very low on this morning. Mr. Guthrie felt chilly when he struck the floor and the boys were soon made aware of it by his fault-finding, but before he could get to the thermometer one of the slickest young chaps in the person of Mr. Seymour put a match to the bulb and when the old man reached that part of the room it registered 80°.

This was most unaccountable and he could not believe his eyes: "That thing is not right," he declared; "the floor committee must take it out, I'll bring my thermometer down." No sooner was the new instrument in position, than the boys worked up that with a cigar, while he was engaged, and when he examined it the matter was made still worse for the registered temperature was 85°! He appealed to his old friends as fast as they entered the room, but all had been previously informed of the joke and were, of course, "hot as blazes," while the thermometer

kept on showing more than summer heat. "It must be in the atmosphere," finally concluded the victim and no amount of talk such as "you've got a chill," "better go home and take a sweat," etc., could persuade him to leave the room. He stuck to the floor and the boys as faithfully kept watch of the bulb. It was noticed, however, that Mr. Guthrie left his office about an hour earlier than usual and was seen to enter one of the Russian bath establishments.

The tariff placed on macaroni has resulted in giving Buffalo another industry. Mr. Onetto, for many years one of the heaviest dealers in macaroni, both foreign and home made, has started a manufacture of his own and is turning out this Italian fruit by the ton every day. Mr. Onetto controls the Italian trade in this product, and as he is the best judge of macaroni in this city there is no doubt his brand will drive all others out of this market.

The question of who bought the Clinton mills was settled by Mr. Thomas Ryan, the canal forwarder, admitting he was, after being charged with the ownership by Mr. George Sandrock. This was against Tom's grain, as he is accustomed to mature his plans in the dark. But the question of what he intended to do with his mill, not being a miller himself, was of great importance, and Sandrock undertook the task of worming this out of him. His ironical reply to the question was: "I do not know, but you can rest assured I will not decide until I have your advice and several others on this floor." This was a little hard on the boys, but they took it good-naturedly in hopes of drawing him out.

As near as could be made out from further remarks was that he intended to run the mill as soon as it was placed in good shape. It is, however, generally believed that he will make an elevator of the property; still it is hard to make a fair guess at what Ryan will do even if he had declared his purpose. As a gentleman remarked after the sagacious Tom had disappeared: "Ryan means to hit the truth, but you all know he is a very poor marksman." The mill has water power and was last run by George T. Enos, who failed, and it then came into the hands of Judge Daniels who was offered \$12,000 for it. What Tom paid will never be told by himself.

The Merchants Exchange decided to increase the number of trustees from 13 to 15, in order that at least eight of the old board may hold over, thereby obviating the necessity of teaching an entirely new lot of the duties devolving on them as such officers. A president, vice-president and treasurer will be elected each year, together with four trustees.

Secretary Thurstone and Assistant Secretary Daly have both been confined to their homes for a month past, the former with a cold and the latter with rheumatism. Bookkeeper Miller was the only man able to be around, but the business of the Exchange was not interrupted or delayed in the least. It would not take long to show the members of the Exchange that the amount of their salaries could be saved as well as not.

George Urban, Jr., has a good memory, but occasional small matters will pass unnoticed for quite a long period. For instance, everybody thought he could tell whether this spring was earlier than last. He thought it was earlier as near as he could judge, but

owing to the neglect on the part of his head gardener he was unable to say just how much. "I have furnished him with a diary every year, but every year I find he keeps it faithfully just long enough to be of no value to me." "Why don't you give him hellick," said a listener. "How can I when I am as bad myself," considerably replied Mr. Urban.

Assemblyman Gallagher, who is a canal forwarder, says the canals will be opened May 1st. If they are not opened by that date the Democratic slow-pokes will hear from the canal fraternity in no gentle voice, but like unto the first impetuous bray of the recreated mule will the scalpers lift up their voice as one man.

The Cataract Construction Company is pushing the tunnel at the Falls as fast as possible. The level will be decided on this week, in the meantime the work of driving a heading and sinking the shaft at the portal is progressing favorably. At shaft No. 1 the depth is 165 feet, leaving 41 feet further to be driven. Shaft No. 2 is down 185 feet, leaving 9 feet to the line of the tunnel.

The old project of building a tunnel under the Niagara river from Buffalo to Fort Erie in Canada is again revived. Among the names mentioned in connection with the enterprise are such solid capitalists as Daniel O'Day and Mr. George Sandrock. The Michigan Central and other roads are compelled to go around the Niagara falls to get to Buffalo and it is hinted that a big Canadian road is deeply interested in the scheme. There is ample financial backing if the two names mentioned are in it.

The boys on 'change are deeply interested in a mysterious compound which was brought from Chicago by Mr. C. A. Warfield. It is a new system for cold storage and the way the brine sent the thermometer down brought out the most conservative "money bags" in the grain trade. A large amount of stock was subscribed.

Leonard Dodge, the North Buffalo miller, has been advising the boys to take on a jag of wheat from the time May was down to 97c. "I tell you, boys, buy this wheat," was the oft repeated advice, and when it reached 105½ the other day he was in great spirits. "Len" does not touch the board himself but is a good authority on markets as well as other good things.

Clint Newman has not shown any marked sapience within the past month or even two, which, to say the least, is remarkable. Occasionally he is consulted by President Scatcherd on some important "inside" movement contemplated by the trustees of the exchange, but outside of giving his consent to the change or proposed innovation he is an ordinary mortal.

Mr. C. A. Pillsbury stopped in Buffalo on his way east a few weeks ago and had a long chat with his friend, Conway W. Ball, chief inspector of grain.

Charles Jones has taken the position of head miller at Peck & Co.'s mill, Horseheads, N. Y.

Mr. Charles J. Bork, proprietor of the Attica mills, is now a member of the Merchants' Exchange.

Jones Brothers & Co., of Belle Flower, Ill., have opened an office here.

Mr. C. H. Gibson, of Whitney & Gibson, has gone west on an extended business trip.

An additional story has been put on Earl & Friend's mill, Angola, this county.

Mr. George B. Matthews and wife have returned from a southern pleasure trip.

J. W. Little & Co.'s barrel factory at Rockport burned March 25th. The loss, beside the building, which was small, included about 40,000 staves and as many squares of heading. The fire started in the dry kiln.

A stock company to build a mill at Oakfield, Genesee county, was organized with a capital of \$30,000.

William C. Urban and head miller Ortner will represent the Urban mill in the millers' excursion to Europe.

The English syndicate is after the Buffalo elevators again according to the Buffalo papers. Secretary Cook, of the association, says it is all bosh.

The officers of the Western Elevating Company elected last week were: President, George F. Sowerby; vice-president, Spencer Clinton; secretary and treasurer, P. G. Cook.

The grass is growing luxuriantly and in spite of the scarcity of millfeed the price of bran is steadily dropping. The latest quotation is \$22.50 for coarse winter and \$22 for spring.

The hay market is getting in position to give Messrs. Heinold & Rhodebough a profit in their heavy holdings. Timothy is going at \$13.50@14.00 in this market.

Faxon, Williams & Faxon, grocers, are still selling their flour at \$4.85@4.95 per bbl., and it is a taking card. It's good flour, too, for the money—but a poor business principle. The object in this cut in prices is to get a run and save on newspaper advertising.

As soon as navigation opens the stock of wheat will disappear so fast that the price of spot will not stop short of \$1.50 per bushel.

The sharpest millers in Buffalo, C. A. Warfield and C. Sternberg are reported to be filled up to the mouth with Chicago wheat for May shipment by canal.

The Lackawanna has started its 150,000 barrel storehouse. It will be finished in July.

Will Mr. Alexander Mann, of Boston, please communicate with Mr. F. J. Henry, of the firm of Harvey & Henry, millers. He may hear of something to his advantage.

The contract for building the Duluth Imperial mill warehouse has been given to a Duluth party.

Rye flour is selling at \$5 per bbl. The last sales of No. 2 rye on track were at 96c.

Some very choice red wheat is coming in from Michigan and Indiana. Sales are easily made at \$1.12@1.13. Country millers are bidding \$1.05@1.07 at the mill but getting nothing worthy of mention. This has created an unusually heavy demand in this market.

BUFFALO.

Buffalo, April 15, 1891.

#### OUR LONDON LETTER.

Crop Conditions—Annual Statements of Some English Mills—Mill Notes—Colonial Reports, Etc.

THE month of March opened with an animated trade, but the weather that set in on the 9th of the month put back the season so much that the English average price soon passed 33s per quarter. The immense snowfall which interrupted even railway traffic, blocked up roads and wrecked ships, followed as it was by over two weeks of frost, made havoc not only with the farm work and stock, but intensified the excitement which has prevailed in the corn markets dur-

ing the month. The excitement has resulted in an advance of fully five shillings per quarter in the price of wheat, and at the end of March we find ourselves doing a steady trade at the advanced prices, even though the reports on the growing crops in France and some other European countries are slightly less favorable than they were three weeks ago. On the other hand the telegrams noticing drought in India and the estimate of the New Zealand wheat crop as 25 per cent below an average yield have to be considered. Prices in England are sure to remain at their present level for two months to come on account of the damage done to the root crops and green food which not only makes cattle food dearer, and consequently meat, but it means a larger consumption of bread among the poorer classes, who cannot afford to buy so much potatoes and green food at present prices. The prices of potatoes for this year, according to the *Kentish Observer*, in comparison with those made twelve months ago, are as follows: Beauties of Hebron are selling wholesale in Ashford at 110s to 130s a ton, as compared with 55s to 80s current a year ago. Early Rose at 110s to 120s against 40s to 90s, and Magnum Bonums at 120s to 140s against 40s and 90s. The average yield of potatoes in Kent last harvest is put in the Agricultural Produce Statistics at 5.68 tons per acre or three-quarters of a ton less than the yield of the previous crop; but as prices are more than 80 per cent higher than they were last year the returns of the smaller crop are much greater than were those of the larger one. According to the annual produce statistics of the Board of Agriculture the United Kingdom and Ireland's total potato crop was about 2,000,000 tons short and with a large proportion of inferior quality, this means that now the year's supply is being exhausted there must be a larger demand than usual in the spring for wheat, maize and other substitutes for potatoes which will counterbalance the more favorable reports of the French crops that are now coming to hand. The average price of British corn as received from the Inspectors and Officers of Excise in the week ending March 28th was 35s 3d for wheat and, on Friday last Duluth wheat was offered and sold at 48s per quarter of 496 lbs.

Some idea of the milling trade of England can be obtained from the following facts which were placed before the shareholders of four different milling firms recently. At the second ordinary general meeting of the shareholders of Messrs. Appleton, French and Serafond, Limited, the profits for the year ending December 31st, 1890, was stated to be £28,599 10s. 6d. which was applied as follows: (1) In providing interest on purchase money to the vendors from 1st January, 1890, to 14th June, 1890, £4,094 6s. 9d. (2) In providing interest on debentures to 31st December, 1890, £2,645 15s. 7d. (3) In payment of directors fees, including managing director, £1,800. (4) In writing off the preliminary expenses, £1,952 14s. 4d. (5) In writing off depreciation for the year, £3,500. (6) In providing the interim dividend £3,052 4s. 9d. (7) In paying a dividend at the rate of 10 per cent per annum, free of income tax, for the half-year to 31st December, 1890, £8,000—£11,052 4s. 9d. (This makes a total dividend for the year at the rate of 10 per cent, calculated according to the dates when the share capital was payable.) (8) To be carried to next year £3,554 9s. 1d.

—£28,599 10s. 6d. The profit for the year is thus more than the certified average profit shown in the prospectus when the company was formed last year. At the second ordinary general meeting of Messrs. James Tucker, Limited, of Cardiff, who are now building new mills, which is the talk among the milling engineers here, it was shown that after payment of ordinary expenses there was a balance of £23,141 and after various sums had been written off, the net available balance was left at £10,015 3s. 3d. Of that amount £3,061 7s. 1d. had been applied in payment of preferential dividend, 6 per cent, upon the preference shares and a dividend at the rate of 5 per cent per annum upon the ordinary shares for the first half-year. These payments left a balance in hand on the 31st of December, 1890, of £6,953 16s. 2d. The question arose at the second ordinary general meeting as to the disposal of that balance. The articles of association of the company had a novel feature in which the workmen shared in the profits. There were five shares of £10 each, under the denomination of "workmen's shares" and 5 per cent, or one-twentieth part, of all funds from time to time appropriated for payment of dividend was allocated to them. The 5 per cent for the year 1890 amounted £465 4s. 8d. which would be distributable among the *employees* in ratable portion to wages earned. The half-year at the rate of 15 per cent per annum, making 10 per cent for the entire year.

The report for the half-year, ending December 31st, 1890, of the Barnsley British Co-operation Society gives the profit (with interest added), for that period as £3,259 18s. 11d. To the mill which with its plant and stock, such as horses, wagons, etc., there is debited a sum of £33,719 7s. 11d. and allowing a depreciation of £13,707 1s. 4d., the present value of this establishment is written down at £20,012 6s. 7d. The grand total profit made by the mill (adding interest and profit) is returned at £142,073 3s. 11d. In 1888 a roller plant was put in at the cost of £5,659 13s. 4d. and has apparently rendered excellent service, as the profit on the three half-years preceding this installation was \$1,399 11s. 2d., whereas the profit earned in the three following half-years has been £5,936 15s. 6d.

The 95th annual report of the Hull Anti-Mill Society laid before the shareholders showed that in the year ending December 31st, 1890, the sales of flour were £33,197 11s. 2d., being an increase of £373 12s. 1d. over the returns of the year before. The quantity of flour sold was 369,470 stones and the net profit, after paying expenses and £112 1d. on loan capital, was £412 4. 7.

On the fourth of March Mr. J. Harrison Carter read a paper before the Society of Arts on "Flour Milling" and in his paper in a general way touched on the various stages of roller milling as well as the various machines recently invented and placed on the British market. Mr. Carter in his paper did not go into the full technicalities of roller flour milling as carried on in this country, so that those millers who went especially to hear a good discussion on the paper were disappointed, although there were a number of milling experts present.

During April the new co-operative mill at Dunston-on-Tyne, near Newcastle, will be started up and will greatly effect the trade in that district as it has a large capacity.

The Easter holidays have as usual with all holidays put business out of gear for some little time which this year is unfortunate, as there was such a good trade being done both in corn and flour.

It is estimated that the wheat crop of South Australia is seven bushels an acre on 1,850,000 acres or 12,950,000 bushels in all. This is much less than was expected before harvest, and not nearly equal to the produce of last year, when 14,577,358 bushels were grown on 1,842,961 acres. Allowing 2,000,000 bushels for seed, and 52 bushels a head for a population of 330,000, the surplus for export is 9,135,000 bushels; adding this to the outside estimate of the Victorian surplus, 10,000,000 bushels, the total surplus of the two wheat-exporting colonies of Australia will be a little over 19,000,000 bushels. A good deal of it will be required in the other Australian colonies, South Africa and Mauritius. Australasia will not therefore sent to Europe much, if any more wheat than was shipped last year. From South Russia comes a report to the effect that the wheat crop is much damaged, this report, however, has not been confirmed.

L. MAYGROVE.

LONDON, March 31, '91.

#### PAPER BELTS.

The most unlimited use to which paper pulp is put proves this to be one of the most valuable, and at the same time cheapest and easily worked, of American products.

In one form or another it has been adapted to the manufacture of a variety of utensils for household use, and applied to mechanical and industrial products with equally good results.

As a substitute for iron, metal and wood it has proved a success, and in many cases superior to either to these, being lighter, equally strong and durable.

It has been found an excellent substitute for iron in the manufacture of car wheels, and for the driving wheels of locomotives. Pulleys are made of it that are pronounced superior to those of either wood or iron. In the manufacture of pails, tubs and other household utensils it is extensively used. But there is one use to which it has been put that is more surprising than any of the others. We refer to its use for belting.

For some time one of the largest paper manufacturing establishments in this country has been turning out paper belts that are declared superior in many respects to either leather or gum.—*Manufacturers Gazette*.

THE Lockwood Press of New York City is issuing a work of great value to the printing and book trade. They publish regularly, and have done so for years, a magazine called the *American Bookmaker*, which has had no small influence on the modern improvements in book printing. Now they have issued the first number of The American Dictionary of Printing and Book making, which will be a permanent work of reference for the trade as well as all interested in books. The work deserves success. Full information concerning it can be obtained by addressing Howard Lockwood & Co., 126 Duane st., New York City. It will be remembered by the milling trade that Mr. Lockwood was for many years the publisher of the *Millers' Journal*, which was in its time one of the handsomest trade papers extant.

**MILWAUKEE ITEMS.**

MESSRS. EDW. P. ALLIS & CO. SECURED the contract for the Eagle Mill at New Ulm, Minn., for \$15,000. There was very strong competition for the job.

HOFFMAN & SCHIMMEL, of Two Rivers, Wis., have awarded their contract for a 100 barrel water power mill to The Edw. P. Allis Co., of Milwaukee, Wis.

MR. J. DONALDSON, formerly of Donaldson Bros. of this city, has returned after nearly four months absence spent in visiting the flour dealers of the Eastern States.

COL. C. A. WINN started last week for Texas on his initiative trip for The Edw. P. Allis Co., of Milwaukee, Wis., and has secured the contract for the new 100 bbl. mill for the Bollinger, (Tex.) Mill Co.

CHARLES ROSS, engineer at Duluth Roller Mills, has invented an attachment which closes any kind of an elevator door whenever the elevator starts for another floor. It is a perfect automatic contrivance.

JAMISON BROS. & CO., of Janesville, Minn., are remodeling and enlarging their flour mill with machinery furnished by The Edw. P. Allis Co., of Milwaukee, Wis.

THE EDW. P. ALLIS CO., of Milwaukee, Wis., has shipped out 125 cars of machinery each month since Jan. 1. This is an average of 40 cars more per month than for the corresponding time in 1890.

A new distillery, said to be the largest in the world, is in course of erection at St. Louis, Mo., and will be equipped with 9 double 9x30 Gray roller mills, made by the Edw. P. Allis Co., of Milwaukee, Wis.

THE SUPERLATIVE PURIFIER MFG. CO., of Milwaukee, have lately shipped New Era Scalpers to Goold Bros. & Co., Howard, S. Dak.; Wise & Tuckey, Paw Paw, Mich.; Patterson & Sisson, Camillus, N. Y. (2 machines); Wm. Smith, Ida Grove, Ia.; Chas. S. Smith, Canandaigua, N. Y.; Clark Mercer & Co., Baldwinsville, N. Y.; George Tomlinson & Son, Perry, N. Y.; Phelps & Sibley, Cuba, N. Y.

THE EDW. P. ALLIS CO., of Milwaukee, Wis., are furnishing 5 double 9x24 Gray roller mills to W. E. Caldwell & Co., of Louisville, Ky., for a 100 barrel roller mill which they are building in Oklahoma Terr.

THE MILWAUKEE BRIDGE AND IRON WORKS made an assignment March 23d, Hamilton Townsend being appointed assignee. It is said that the liabilities are about \$200,000, while the assets are nearly double that amount, but require a little time to realize on them. Much of the work done is for various municipal corporations and railroad companies. We do not doubt but that the Company's affairs will be adjusted satisfactorily to all concerned.

THE PILLSBURY WASHBURN FLOUR MILL CO., of Minneapolis are taking out the middlings buhrs in their mill B, and putting in ten double Gray's roller mills, furnished by The Edw. P. Allis Co., of Milwaukee, Wis., and the Sidle-Fletcher-Holmes Co., are adopting the same improvement in their Anchor mill.

THE SUPERLATIVE PURIFIER MFG. CO., of this city, have recent orders for New Era Scalpers from Jacob Amos, Baldwinsville, N. Y. (2 machines); Theiss, Kuegle & Co., Columbiana, O., (double machine); Bradford Mill Co., Cincinnati, O.; Fred Starz & Son, Delavan, Ill.; Neal Bros., Portland, Ind., (2 machines); Barnard & Leas Mfg. Co., Moline, Ill.; A. F. Ordway, Beaver Dam, Wis.

CHURCH & CO., the large baking powder manufacturers of New York, have contracted with The Edw. P. Allis Co., of Milwaukee, Wis., for a full line of rolls, bolts, purifiers, and other machinery with which to fully equip their establishment.

AMONG the gentlemen connected with the trade that have called on the UNITED STATES MILLER during the past month were R. D. Aitchison, of The Robert Aitchison Perf. Metal Co., Chicago, Ill.; B. H. Sanford, of B. H. & J. Sanford of Sheboygan Falls, Wis.; and B. F. Ryer of Chicago, Ill., representative of a prominent eastern firm of mill furnishers; also Mr. John Munro, representative of Aug. Heine, manufacturer of milling machinery at Silver Creek, N. Y.

W. D. GRAY of The Edw. P. Allis Co., of Milwaukee, Wis., was called to New York last week on business connected with Jones & Co., the owners of the 2500 barrel mill, who, having recently put in 45 Gray's flour dressers and centrifugals, were so pleased with the results obtained that they decided to put in 28 more making a total of 73. This action will necessitate the throwing out of an equal number of comparatively new bolts of another make.

THE ELECTION OF OFFICERS in the Chamber of Commerce is over. The "boys" of the organization were the winners on the question of who should be the weigher, and the regular caucus nominees were elected from the top to the bottom of the list. They are as follows:

President—E. P. Bacon.  
First Vice-Pres't—F. H. Magdeburg.  
Second Vice-President—Alex. Berger.  
Secretary—W. J. Langson.  
Directors—F. G. Bigelow, Robert Krull, Robert Elliot.

Board of Arbitration—C. M. Payne, John Foley, Jr., C. M. Cottrill, A. C. Zinn, A. G. Bodden.

Board of Appeals—C. F. Ilsley, E. Hotchkiss, L. R. Hurd, Oscar Mohr, C. E. Lewis.

Grain Inspector—F. D. Hinkley.  
Weigher—F. F. Clapp.

The highest number of votes cast for a candidate was 203, and with the exception of weigher and second vice-president there was only a slight variation in the number received by each. Mr. Bacon had the entire vote for the presidency, and there were only one to three scattering votes in any instance except the two noted.

**MINNEAPOLIS NOTES.**

THE DIAMOND ELEVATOR was destroyed by fire April 9th. It was well insured.

THE RESPECTIVE RIPARIAN RIGHTS of the Minneapolis mill company and the Minneapolis Union Railway company must be settled in court.

JAMES PYE of Minneapolis, has secured the contract for erecting a 400-bbl. mill for Messrs. Everett, Aughenbaugh & Co. at Waseca, Minn.

DURING the latter part of March the packers and nailers in the Minneapolis flour mills had some trouble over hours of labor, wages, non-union employees, etc., but at last reports matters were amicably adjusted.

THE INTER-STATE GRAIN CO., is about to erect another elevator on the east side at Minneapolis, to have the capacity of one million bushels. The total elevator capacity is now 16,700,000 bushels. The new elevator and smaller ones projected are expected to swell the capacity to about 18,000,000 bushels this year.

THE FARMERS and elevator men doing business in North Dakota recently met

the railroad commissioners of that State in Minneapolis to hold a conference in relation to the new law which, the elevator men claimed, would force them out of business. A plan was finally suggested which will allow business to go on practically as heretofore, and without violating the law.

THE MINNESOTA GRAIN AND FEED CO., whose plant was destroyed by fire April 18th announce that they will rebuild at once on the old site. The new mill and elevator will be larger, with the latest improved machinery and better facilities for handling grain. They have made arrangements to have all orders filled promptly until they get things running again.

THE LAKE SUPERIOR TRANSIT COMPANY'S fleet of eleven passenger and freight vessels will this season engage in the flour and package freight business between West Superior and Buffalo. The total tonnage of the fleet is something over 30,000 tons, and it is surmised that a deal has been made with Minneapolis flour shippers to bring about the change. The fleet will handle a great part of the immense stock of flour in Eastern Minnesota railway sheds.

A RECENT DESPATCH from Minneapolis says:

"Ten Minneapolis mills, with a daily out-put of nearly 20,000 barrels, have formed a combination against the great Pillsbury-Washburn English syndicate. The owners of the mills claim that they were compelled either to go into a combine of their own or go under the wing of the great institution managed by C. A. Pillsbury. It is understood that the opposition mills will in a few months be placed under one management, with one set of grain-men and all the other economies of concerted action."

JUST HOW MUCH TRUTH there is in this rumor we do not know. Something of the kind has been periodically talked of during the past year.

**MODERN FLOUR MILLING.\***

BY J. HARRISON CARTER.

THE difficulty I have experienced in the preparation of a paper on "Modern Milling" has been to make it interesting to the general members of our Society, and, at the same time, satisfying to those specially interested in the subject, and consequently, more or less conversant with its technicalities. I have, therefore, been obliged to intersperse my critical examination and exposition of the various details of flour manufacture with some brief explanations which will, I hope, make my paper an educational one to members who have not previously studied the manufacture treated of.

And first, it appears to me I must explain to the uninitiated what was the general system of millstone milling in use just prior to the introduction of roller milling, and inform them of some of the leading points in roller milling, in order that they may appreciate the advantages of the latter.

The wheat-cleaning plant was similar to that at present in use, with a few exceptions, but was being gradually improved. The grinding was universally done by millstones, the object being to make all the flour-containing portions of the wheat into actual flour in one operation, leaving the bran or offal portions, after being dressed, free from flour.

The millstones were usually 4 ft. to 4 ft. 6 in. in diameter, resembling, in quality, the small one which has been

\*[A paper read before the Society of Arts, London, March 4, 1891.]

lent to me for your inspection, and similar in style of "dress," that is, in the arrangements of the lands and furrows. An exhaust fan was used to draw air through the stones when at work, to keep the meal cool.

The dressing was done in the best English mills, and practically in all the Irish and Scotch mills, by long slowly revolving hexagonal reels, covered with a tightly stretched silk dressing cloth. In some English mills—generally in the southern country district—"bolting reels" were used, or "wire machines," the former consisting of a cleverly made seamless woolen sleeve or cylinder, fastened loosely at both ends, and outside of a skeleton reel. When running at its full speed—from 150 to 200 revolutions per minute—and with the feed on, the worsted cylinder expanded, and rubbed against the outside fixed rail of close-grained hard wood, which action induced the flour to come through. When worn into holes the cloth was darned like a stocking. Cloths made in the same form, but of flax, hemp, and silk, have been tried, but are not sufficiently durable.

I describe this machine somewhat in detail, because it is still used in some small country mills; whilst in many districts in England it has never been seen even by millers.

"Wire machines" are slowly revolving cylinders covered with wire, and having inside a set of brushes revolving rapidly, brushing the flour through the wire cover. Circular brushes outside the cylinder slowly revolve against it, keeping the wire meshes clear. The best made of these machines are excellent examples of mechanical construction, but their action is severe on the material they are operating. The silk reels produce considerably better flour.

The offal in the stone mills was divided by a simple machine into various grades.

This is a brief description of the English millstone system of flour manufacture prior to the roller mill era.

To demonstrate to you concisely, but conclusively, why the millstones give inferior results to roller mills, I shall quote first from my first paper on milling, read before the National Association of British and Irish Millers in 1879; next, from a paper read before the Society of Engineers in 1883; and, thirdly, from another read before the Amalgamated Society of London Operative Millers in 1882.

1879:—"If you forget everything else I have said to you to-day, please remember this, that with your heavy millstones, with their large surface, operating by friction, you reduce the wheat in one violent, tearing, rubbing, fretting action into a mixed mass of flour offal and offal-flour, which can never afterwards be entirely separated the one from the other."

1883:—"It has never been conclusively proved over what surface of stone the wheat has been caused to traverse before it escapes; but it is believed to be at least three or four feet. Those of you who know what a French burr stone is—so porous, so rasping in its action, and, when made into a millstone, so flat on the surface—will understand that this ordeal of grinding, this extreme of frictional treatment over so large a surface (and a smaller surface with the flat face of a millstone is not sufficient) is enough to rasp off the bran an excessive quantity of bran flour; and so it is spoiling the flour, and spoiling the loaf."

1882:—"The shape of the corruga-

tions of rolls, as well as the material, is more scientifically correct than millstones. If you are using a five-break system, for instance, it amounts to little more than the wheat passing five points, as compared with the three or four feet on the millstone."

The present century is often called an "Iron Age," and iron has entered into the very midst of the milling industry. It has been the privilege of Englishmen to be leaders in many of the triumphs of iron, but in the one we are discussing to-night the laurels belong to another nation, Hungary occupying the position of honor. She had for years sent us some splendid flour; and because the quality of her best brands was not materially improved on the adoption of rollers, those of our millers, who would have welcomed their failure, jumped at the conclusion that they had failed, entirely overlooking the fact that arrivals from Hungary of the old splendid qualities increased rapidly in quantity with the substitution of rollers for stones; and they did not know that a larger percentage of this good flour could be produced from the same quantity of wheat. I will explain this circumstance by the following.

At the present time the very highest priced semolina (a very small proportion), sold as such in Southern Europe, or for making into the finest macaroni, is manufactured by millstones, which completely eliminate all traces of bran from the semolina particles, but in doing it so greatly reduce the value of the remaining product that millstones for this purpose are also being gradually replaced by rollers.

Having now, with this reminiscence, given the uninitiated some opportunity of appreciating the superior merits of recent innovations, I at once gladly deal with the direct title-subject of my paper, namely, "Modern Flour Milling."

I propose referring, in such detail as the time at my disposal will admit of, to the following portions of the paper:—

I. The buildings.

II. Grain storage.

III. Wheat cleaning.

IV. The flour mill.

In the first place, the buildings must not only be suitable for the milling business, but must be designed to meet the exacting requirements of fire insurance companies, and even to anticipate precautions which they, at present, do not demand.

The engine and boiler-house must be separate from each other, and, by preference, outside the other buildings. When of necessity they must be within the mill walls, they do not add to the insurance rate if proper party walls are built, but usually interfere in some way with storage arrangements, or elevating, conveying, etc.

The wheat and manufactured products must be stored in buildings preferably separated by a space of ten feet from the mill (in order that the advantage of the lowest warehouse insurance rates may be derived), and only connected with it by a spout or a light, open gangway. When the latter is used there must be double iron doors at each end.

Only one of the buildings bordering this ten-foot way may have windows. If there is no choice but to have these storage buildings contiguous to the mill, the dividing walls must be carried through and above the roof, which preferably should be flat, and of fire-proof materials, the ordinary old type of mill roof being the point from which most fires spread to the adjacent buildings.

Spouting only, as a rule, is allowed through the partition wall between mill and warehouse, or mill and wheat-cleaning building; and this must be inspected and approved of by the insurance company. Any spout hole should be as near the basement as possible.

Communication may be by open gangways outside the mills, as in the case previously referred to, if the usual insurance requirements are complied with.

The flour mill building should, above all things, be of ample dimensions, having five floors, each about 12 feet high, except the top floor, which should be about double this height; at all events in that portion of it where the elevator heads are placed.

The floor should be of 3 in. planks, resting on beams or girders of ample strength, and 8 ft. or 8 ft. 6 in. apart from center to center. Above the planks a diagonal flooring of 1 in. boards should be laid, certainly for the roller and purifier floors, if not for the others. This construction is infinitely preferable to board and joist floors, if for no other advantage than in the case of fire, it resists the latter much longer, giving a better opportunity for its extinction.

The mill should be designed of sufficient strength to admit of high and wide windows between each abutment, on all sides of the building, if possible. Above and before all, there should be sufficient area to secure such an arrangement of machines as will provide ample room for the men in charge to examine and attend to all working parts, and the manufactured products of each machine, without any inconvenience or risk.

The electric light is a modern adjunct of the highest advantage to the manufacturer, and, if properly installed, diminishes the risk of fire as compared with gas. Every mill should be fitted with sprinklers and other fire-extinguishing appliances.

Insurance companies are said to have lost heavily on flour mills; if they have, it is their own fault. They have imposed, from time to time, a higher and still higher rate, so much for this class of new machine, and so much for that, but never any tariff charge for overcrowded machines and stock; no extra charge named for uncleanness, and nothing imposed for want of light by day, and naked lights by night; and yet it is my firm opinion that more fires are attributable to these three causes than to all others put together.

I make no apology for dealing at what may appear inordinate length on this subject. It is not a question which can be settled by the factory inspector, but it materially affects the health and comfort of the operative and the balance-sheet of the master miller.

#### GRAIN STORAGE.

Grain is now stored, by preference, in silos, and I know of nothing that can be said against this system. It is probably of Scotch origin, high circular hoppers having long been used in that country; but it is to America we owe their scientific development.

In this country the first large installation was completed for the Liverpool Grain Storage Company. The design was well considered, and has been a very great success, though when first put to commercial test it was found by the purchasers of grain most unsatisfactory, the wheat purchased by sample coming from the silos of very unequal quality, sometimes much better—when, naturally, it was not complained of—

but on other occasions very much inferior, entailing a serious loss. This irregularity was caused by the tendency of the heavier—that is, the better—portion of the wheat to separate itself from the inferior, or lighter, portion, whilst being drawn from the silo, the heavier displacing the lighter and escaping first, the consequence of which can be easily understood.

Sprague's and Henderson's methods for overcoming this are somewhat similar; the former I can describe as consisting of drawing off the wheat from the top by means of some wooden slotted trunks fixed to the sides of the bin, at the same time that it is drawn in the ordinary way through a spout at the bottom. This results in a perfectly uniform sample. It was adopted by the Grain Storage Company, and now from it and all other silo granaries wheat can be relied upon as being true to sample.

Only one serious accident has occurred in England after the completion of silos. The weight they carry being frequently enormous, great care has to be exercised in their design and construction.

The cost of storing in silo is very small, and I would strongly recommend the system to millers who freely use English wheats. The conveying and elevating arrangement for filling and emptying is seldom required continuously for this purpose; and it can therefore be employed without any great personal attention being required in frequently drawing out of one silo and emptying into another any wheats which may be at all out of condition, the moving, especially if, as there should be, there is an aspirator under the main elevator, greatly improving the condition of the wheat.

For procuring the necessary mixtures of wheat for grinding, various automatic mixers have been used, most of them being measuring appliances. I do not consider them sufficiently accurate and much prefer automatic weighers.

The usual system of drawing off the mixture for wheat cleaning is to fill these weighers from three, four, five, or more silos, elevating each kind direct into the same number of smaller silos situated close together, and called the mixing silos. The automatic machine under each of these smaller silos takes out of each the required proportion, and it is then consigned to the wheat-cleaning bins. But this use of the nest of mixing silos necessitates double elevating and conveying.

In some extensive silos which I have just designed, a method has been adopted dispensing with the mixing silos and substituting the use of weighers, made portable for placing under any of the main silos, in number corresponding with the varieties of wheat forming the mixture at any particular time.

The system of automatic weighers which has commended itself to me, secures a simultaneous discharge of all the weighers, each with its varying proportion of wheat, thus securing an equal blending of the mixture.

#### WHEAT CLEANING.

This is a very important part of the manufacturing portion of the process, and one which is deservedly receiving an increased amount of attention. Some of the necessity for an elaborate plant is caused by careless husbandry in foreign countries, and much more from roguery, the chief offenders being India, Egypt, the Argentine, and Russia, the ratio of offense being, I

think, chargeable in the order named. It is a cause of pride to Englishmen to be able to state that wheat is sent to us by English colonists and our American cousins in a much cleaner and more trustworthy condition; but it is with deep regret that I feel obliged to strongly condemn the action of the London Corn Trade Association, at a conference on Indian wheat impurities held in May, 1889. It was convened at the India Office by Lord North, and presided over by him. His lordship, in advocating the importation of clean wheats, said: "Some parcels had more than the allowable 5 per cent. of dirt, and that our annual importation of dirt in Indian wheat reached the astounding quantity of 3,000,000 cwts." Corn trade associations from other ports, Chambers of Commerce, the Millers' National Association, independent millers by the hundred, testified in writing or by their presence, to the fault in the present system, but it remained virtually for the London Corn Trade Association to uphold it, doing so in a long report, in which I have failed to find one single sentence showing a disposition to co-operate for a reformation.

I have been informed that Messrs. Ralli Bros. ship seven-tenths of the Indian wheat; and I believe they are members of the London Corn Trade Association. Their representative at the conference, Mr. Manuell, said: "When cleaner wheats are offered by us, we do not get the value." I appeal to every miller present—Is not this an absurdity? Does not a miller, every time he makes ever so small a purchase, judge by his practiced eye and hand, and sense of smell, what the sample is worth, and bid accordingly? Why, therefore, should he make an exception in the case of Indian wheat? Granted for a moment that he does make an exception, why is it? Simply, I believe, because of his helplessness under the "Fair average quality" shipping contract, by which stones and dirt are actually admitted up to 5 per cent.

This has an important bearing on competitive modern milling, which our society has recognized in papers read by Mr. John McDougall, which attracted a vast amount of attention at the time, but which have so far resulted in but very slight improvement. The importance of this matter has induced me to make these remarks on the subject.

In Indian, as I have said, and some other wheat there is a great quantity of stone and dirt, which is a source of great trouble necessitating a complete preliminary wheat-cleaning plant, composed of the following machines:

First, a warehouse separator, of which several designs are made. It consists of a set of sieves of perforated iron or steel of various meshes. Extraneous matter, also beans, maize, &c., pass over the top coarse sieve, the outsiftings passing to another sieve of finer mesh, through which fine dust sand and seeds fall, the over-tails being the cleaned wheat, which passes through an air-current produced by a fan forming part of the machine, and which exhausts a large quantity of light dust and chaff, &c., &c. The wheat then falls to a second machine, which is a grader or sizer, dividing it into three, four or more sizes. Some engineers use sifters for graders, others cylindrical machines.

Each size of wheat passes into a separate cylinder of thick metal, having drilled or indented cavities close together.

What are known as "Victoria" cylinders have the indentations on the inside. The purpose for which these machines

are used is to separate from the wheat the oats, barley, cockle, and other seeds, stones, dirt-balls, &c., and generally all bodies of different shape from wheat grains. They are usually arranged in two rows, one above the other, the top row extracting oats, barley and all grains larger than wheat; the bottom row removing cockle and all round seed smaller than wheat. The indentations in the top row lift the wheat, depositing it into a trough suspended from the axis of the cylinder, the oat and barley escaping at the end. With the lower cylinders the operation is exactly reversed, the indentations carrying up the cockle and allowing the wheat to escape at the end. Each cylinder is drilled to suit the mesh of that part of the grader from which it receives its supply.

The next part of the process is that of washing. Washing has long been considerably practiced in France, especially in the south, where they wash all the wheats, whether native or foreign. To a lesser extent it has been practiced in England; and though with us there is still a lingering prejudice against it, our leading firms are gradually adopting it as a recognized portion of the wheat cleaning department, most of them, very rightly, using washing machines for hard wheat, even if it does not contain any perceptible amount of dirt.

An ordinary type of washer consists of a tank partly filled with water, which is being constantly changed. The wheat is delivered on to the water, when the stones and heavy particles sink to a receptacle in the tank, and the wheat is carried on by the water to an inclined worm, partly in and partly out of the water. That part of the worm in the water is enclosed in a wire cylinder, whilst the other part revolves in an open trough. The turning of the worm breaks up the dirt balls, etc., which are separated from the wheat by the water, and settle in the tank. The wheat, as it is carried up by the worm, is partially separated from the water in that portion of the worm outside the tank, and is delivered at the upper end of the worm into a whizzer, or centrifugal.

From the centrifugal machine the wheat passes into sacks, in which it remains for periods of from 24 to 36 hours, during which time some of the moisture passes away by evaporation, and some by absorption into the kernel of the wheat.

It is important that there should be no breaking or grinding action by the machines which precede the washer, or by the washer itself, or water permeates unduly to the flour portion of the berry and is injurious to it; at the same time there must be sufficient action to break the dirt balls, but without abrading the bran.

Wheat washing is an operation which will repay further experiments. I am favored with letters from French millers strongly recommending its use for all wheats.

We have now left the washed wheat in sacks and still very humid. In the case of very hard wheats the absorption of the water toughens them, and enable the break rolls to produce larger bran, but it is a question whether this is the true method of toughening. Even the driest of wheat contains a certain percentage of moisture, and bakers do not wish to purchase water at 2d per pound whilst they can procure it almost for nothing.

I have never tested, in actual work, the method of wheat-heating, originated, I believe, in America; and am

not aware whether the system is or is not extensively used in that country now. It was tried by a few British millers, but never largely persisted in.

The effect of heating is to draw the moisture from the flour, or kernel portion of the berry, to the skin or bran; and this should, apparently, benefit both. The heater, when used, is placed to precede the first break roll.

Instead of leaving the washed wheat in sacks, as previously referred to, it is now frequently taken at once into kilns.

There are several kilns in the market. It is my firm opinion that those will ultimately be found the best which are large or roomy; that is, which, instead of holding a small quantity of wheat, and drying it under a high temperature, in a short time, will hold a large quantity, drying it under a lower temperature in a longer time.

In my first paper on milling, read before the National Association of British and Irish millers in 1879, I expressed myself as follows:

"Our native wheats I would strongly recommend being dried, when in the condition in which they came to the mills this year. Drying does not injure the grain in any way; and if it is wheat which has been properly matured and merely became wet after cutting, it gives back a great part of its intrinsic excellence. If the wheat is not matured, as in the case with most of this year's crop, drying does, to a certain extent, mature it. Old native wheat is more valuable than new, simply because it has in the stack been subject to a slight warmth or sweating—has, in fact, been drying.

"Wheat, on the ordinary kilns, is subject to a heat of from 70 to 100 degrees Fahrenheit. The waste varies from 2½ to 7½ per cent; but this year from 5 to 10 per cent; and, in the experience of some Irish millers, from 10 per cent to 15 per cent.

"Do not think that kilns are only useful for drying native wheat. They can be used with advantage for drying washed Egyptian wheat, and, by a slight modification, for fumigating heated wheats. If a cargo of the latter be only slightly heated, the smell may be entirely removed by putting a certain quantity of sulphur and sal ammonic on a clear fire, and allowing the fumes to pass through the wheat."

Applying the advice I gave in 1879 to the present time, I should say wash all your foreign wheat which would not be injured by the water.

Experts will be thinking that I have overlooked the practice of conditioning hard and soft wheats by mixing them. This is a very easy system to adopt, but is imperfect.

Years ago I advocated the separate rolling and dressing of wheats of diverse conditions, and I have not changed my opinion, because it is impossible to alter the natural peculiarities of various wheats sufficiently to make the grinding, and more especially the dressing process, uniformly suitable for both. This system necessitates mixing the flour.

Having completed the preliminary cleaning of wheat containing large quantities of dirt and stones, we come now to the ordinary mixing of wheat. This is drawn off in the required proportion from the various silos, and passes off into the final wheat-cleaning plant.

I should mention that this mixture is partially made up of the wheat which has been through the preliminary wheat-cleaning plant. This is an elab-

orate process, and rightly so; at the present time it would pay for greater elaboration. For example, the roller mills, scalpers, purifiers and dressing machines in a mill of large capacity are of the same size, speaking generally, as in a plant of medium capacity; whereas in a wheat cleaning plant of large capacity the machines, excepting only the indented cylinders, are usually of much larger size individually, but not proportionately so numerous as they should be. I believe the same advantage would be derived from additional sifters, separators and scourers, as certainly is obtained by the additional indented cylinders; that is, a more perfect operation would be performed.

Again, it is almost a universal practice to run the roller plant night and day (though there is an extra insurance charge for night work); but it is almost as universal a practice to run the wheat-cleaning plant during the daytime only. Millers would undoubtedly benefit by running the latter continuously.

The *modus operandi* of a wheat-cleaning plant might be as follows:—

The wheat should first be passed through an automatic weigher; then over a magnetic separator; then to a grain separator, consisting of sieves and air currents, which extract light and inferior grains, chaff, seeds, sand, etc., which escape the warehouse separator. From thence the wheat passes on to grading machines to be graded for the oat, barley, rye and cockle cylinders, described in the preliminary plant. This operation is succeeded by a wheat-scourer, with a fan and exhaust trunks attached, by which means weevil-eaten and inferior grains which have broken up or opened out by the beaters, or branny particles or chaff released from the wheat berries, are all separated from the wheat. A second scourer and aspirator is then used; then the only remaining operation is that of polishing through brush machines, and weighing through another automatic weigher to ascertain what has been lost by cleaning.

#### THE ROLLER MILL.

I now come to what is looked upon as the flour mill proper. In olden days it was a combined warehouse, or mill. In the present day of scientific milling, a rule which should always be, and is observed in a few cases, is that there should be no sack in the mill, and no machine in the warehouse.

The first great principle I would lay down for successful flour milling is exactness, cleanliness, and neatness. It is not only good of itself, but the training of young master and operative millers in the observance of cleanliness and order, means the cultivation of the habits of exactness of all things which will conduce to making them successful millers. The cleanest mills, as a rule, belong to millers who make the best flour. A carelessly kept mill is a bad one for a baker to purchase from; bad for an insurance company to insure; and, generally, an unprofitable one to the owner.

The usual depreciation for the wear and tear of flour-mill machinery should be considerably increased in the case of mills where cleanliness and general attention to the machines are not carried out.

The processes in an ordinary roller mill plant are:—

- 1st. The break roller process.
- 2nd. Scalping.
- 3rd. Purifying (which, however, is preceded by some dressing and grading).
- 4th. The smooth roller plant.
- 5th. The dressing process.

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#### BREAK ROLLERS.

A French miller, after a recent tour of English roller mill inspection, told me that he thought our weak point was the overcrowding of our machines. And there is much truth in this statement.

Recent controversy in the department under discussion has foreshadowed advantages to be gained by decreasing the number of breaks. My first mill was erected on the four-break system; a fifth break was then added with apparent advantage, and then a sixth with like results. The modern four-break advocate will acknowledge this, but will no doubt say he also would have added the two machines, but divided their work between the second, third and fourth breaks. But I always found that with only four breaks, the steps of reduction had to be so decided that the thick portion of the roller corrugation had to enter the wheat deeply, causing an undue amount of break flour to be made; and this I found in a less degree with five breaks. I erected two mills with seven breaks, but found no advantage over six. The estimated gain in four breaks, if made at all, certainly accrues from lessening the number of elevatings, scalpings, and sputtings, and the consequent reduction of the general pulverization of the material, while branny particles are present. It is probable that the conversion of the first break roller into a machine which is to do work nearly approximating to the old second break, may be sanctioned. In our English early days of roller milling, the miller at once appreciated the advantages, as he thought, of the first break process, and frequently added the machine to precede his millstones, and immediately thought he saw a great improvement of his flour. But how could there be a great improvement when all he had succeeded in doing was removing, say, ½ per cent of inferior flour?

Relying, in 1883, to an able millstone advocate (since become an ardent roller convert, but, at the time, only shaken in his faith to the extent of the first break), I said, "My opinion is, that this first break question, which is receiving so much attention, is very much exaggerated by those who have looked at the first break flour. A great part of the inferior colored flour is made in the last break; but every ½ per cent of low grade flour which can be separated from the good, should be so separated."

The constructive features of roller mills would repay careful examination but as other departments are, in my opinion, more important, and time is pressing, I pass them by.

(To be concluded in May issue).

**HOW SOME PLANTS ARE RUN.**By H. A. S., in the *Stationary Engineer*, Chicago, Ill.

OME time ago I was informed by an engineering company that a certain electric light station was greatly in need of a capable engineer, and if I wanted to take the position they would recommend me. They told me what the wages would be and the hours that I would have to put in, and after sizing it up in my own mind I thought I would try it, for although I saw lots of hard work ahead, I also saw a good opportunity to learn something. I agreed to take the place and they telegraphed accordingly. The reply soon came to send on the man, and I went, taking with me a young man whom I proposed to use as my assistant.

As soon as I arrived at the place, I asked for the location of the station and it was pointed out to me; a cloud of exhaust steam nearly hid the place, but the irregular barking of the exhaust enabled me to readily find the place. I stepped in through the boiler-room door, asked for the engineer and was informed that they had none, that the superintendent was looking after the engines and dynamos that night. I started in to find the superintendent, but what I saw before I reached him made me almost sorry that I came. As I ducked my head under a belt I received a couple of drops of hot water on the back of my neck from a flanged union in the exhaust pipe above, which ran directly over the door; this was leaking at the rate of about ninety-five drops a minute. I had got all of that I wanted, so I went ahead looking for the superintendent. I found him at the other end of the engine room with a troubled look on his face and an unusual quantity of oil and dirt on his white sleeves, for he had pulled off his coat and gone to work like a man, but his success so far had not been of such a nature as to relieve his woriment of mind. I could not blame him for being troubled for the engines, of which there were four, were working like trip-hammers, and frequent flashes from the dynamos were sufficient to bring consternation to the soul of any person who had not "been there" before.

I did not propose to back out after having come that far, so I walked up to the superintendent and gave him my letter of introduction. While he was reading it I sized up things hastily and came to the conclusion that at least two engines were working steam mostly on one end, as they were jumping so that there was a great possibility that the steam pipes would be either broken down or parted. The superintendent, having finished my letter, said he was glad to see me and would like to have me take hold as soon as possible. We had had no supper yet, but I thought I could help things some by doing a little adjusting on one or two of the engines before attending to the inner man, as it went against my pride as an engineer to see machinery working in such a terrible manner. I sent my assistant outside to listen to the barking of the engines and make motions to me through the window. I took a monkey wrench and went for the valve-stem of the largest engine; there was a right and left coupling on this and I commenced turning the coupling and watching the signals from my assistant until by a nod of his head he indicated that the exhaust was about balanced. I then went out and satisfied myself that things were in a fair condition, then we went for another engine in the same way. This soon began to work

better and the steam pipes stopped their shaking. I then investigated a flashing dynamo and by changing the brushes a trifle I soon put an end to that trouble. About this time the fireman came in to see what was the matter as he had been compelled to close the dampers to keep the steam down, a thing which said had never occurred before since he had been there. I asked him if the boilers were blowing off and he answered: "Oh no." I told him not to let the steam get any higher, for, as I had not examined the boilers yet, I did not want any of them to go off and leave me until I had had an opportunity to become somewhat acquainted with them.

About this time I thought I had done enough to have earned my supper, so my assistant and I were making preparation to go to the hotel when our nostrils were assailed by a strong smell of burning grease. The words "hot box" were simultaneously ejaculated by the three of us at about the same time and for a few moments there was some lively hustling around feeling of bearings, until we located the trouble on the shaft, which appeared to be out of line, so we slacked the boxes, gave it plenty of oil and trusted to luck to carry us through until the next day, but then I was told that it did not matter much as they frequently had to shut down to splice a belt, cool a hot pin or do some such work. I thought if they could stand a shut-down I could, so we went to the hotel, got some lunch and retired for the night.

The next morning I went over to the works and waited for an hour or more till some one came to unlock the door. An examination of the place by daylight did not impress me very favorably with the manner in which it had been run. The fire room floor was covered with broken coal, dirty waste, pieces of broken brick and various other material to a depth of several inches, fire tools and broken scoop shovels were scattered around promiscuously in front of the boilers and dirt was present in abundance. I noticed several cracks in the boiler walls, and a pile of fire bricks which laid in a corner, I was informed, was a part of the furnace linings. A look on top of the boilers revealed a reprehensible state of affairs, — bricks, boards, broken shovels, dirty waste, old overalls and several wheel-barrow loads of like material covered the top of the boilers, while all around the safety valves was a dense coating of whitewash, showing that a portion of the sediment had been worked out of the boilers through the top blow-off.

After taking from the first safety valve lever an extra weight of 40 or 50 pounds, I tried with my fingers to move the valve-stem but failed. The fireman then informed me that the safety valves had not blown off for a long time past because he could not keep steam enough until last night. After ordering the rubbish removed from the tops of the boilers, I examined the fire boxes closely, finding about a dozen warped grate bars, furnace linings and bridge walls down and boiler sheets, badly coated with sediment from the water which had leaked through some of the seams. About this time I began to be anxious to know how the interior of the boilers were, but as they had been running for some time without accident, and as I had more than I could get through with in one day's time, I concluded to do as they had been doing before—trust in luck for the next twenty-four hours before examining the interior

of the boilers. With a couple of extra men at work I got things cleared up a trifle so that by starting-up time they presented a little better appearance and the color of the engines at least was visible. That night everything started up very nicely considering there had not been much overhauling of the machinery.

It took about two weeks to get that plant in what I called reasonably good shape, but after that length of time things worked very nicely and we all, fireman included, had some leisure in which to get acquainted. For a wonder the boilers inside were found in very good shape, although containing a thicker coating of scale than I desired to see, but with the leaky parts caulked tight and a surface blow-off put in and the use of a reasonable amount of kerosene oil and sal-soda we soon had clean boilers. It is not necessary to mention all the little details that were gone through to improve the condition of things, but there is one thing that I wish to mention. There were two steam pumps in the engine room, one of which I was informed had been "out of fix" for several months. On examining it I found that new packing and a little oil was all that was required to put it in serviceable condition. I do not think it is necessary to say any thing more about this plant or you might think I was blowing my own horn too strongly, but the above facts have been given merely to show how some plants are allowed to run down. After getting this plant in shape I put in several months' time in charge of it in a very satisfactory manner to myself, as there was but very little trouble with engines, boilers or dynamos, and everything went on very smoothly.

**OUR LEGAL DEPARTMENT.**

*Specially prepared for The United States Miller and Milling Engineer, from the latest decisions.*

**A DECLARATION ON TRUSTS.**—Judge Pryor, of New York, in a decision sustaining the demurrer of a combination, recited a few legal principles which are familiar to lawyers. After describing the combination entered into by five companies, he said:

"Here there is an agreement, of which the inevitable effect is in conformity with its proclaimed design to restrict competition in trade, and arbitrarily to enhance the price of a commodity of commerce. That such a contract is repugnant to public policy and so unlawful is a settled principle in the jurisprudence of this country. The people have a right to the necessities and the conveniences of life at a price determined by the selection of supply and demand, and the law forbids any agreement or consolidation whereby the price is removed beyond the solitary influence of legitimate competition."

**DAMAGE FOR REBUILDING MILL DAM.**—Where a mill dam is maintained under a contract by which one party is, under certain conditions, bound to contribute upon demand of another, a specified share of the cost of rebuilding it, upon the happening of the conditions, and after a demand, the other party may, upon failure to comply with his demand, proceed to rebuild the dam and recover from the party in default his share of the cost. Nor is it any defense to the action for such recovery that the work might have been done at a less expense, unless it is shown that it was wilfully and maliciously built at a greater cost than need have been. If rebuilt to the best advantage under the circumstances, the fact that another man under other

circumstances might have rebuilt it for less will not prevent recovery.—*Webb v. Laird*, Supreme Court of Vermont, 20 At. Rep. 598.

**ROLLER-MILL PATENTS.**—Patent No. 222,895, granted December 23, 1879, to William D. Gray for "an improvement in roller grinding machines," and patent No. 238,677, granted March 8, 1881, to said Gray for "a roller-mill for grinding grain," are anticipated by the Nemelka Austrian and French patents of 1875, and the Nemelka Lake English patent of 1877; the adjustment of the rolls provided for by the Gray patents being accomplished by the Nemelka patents, though somewhat differently placed or modified. Reissued patent No. 10,139, granted to W. H. Odell, for a "roller-mill," (original granted December 13, 1881,) is void for want of invention, the device being but the connection of the two shafts in a double roller mill, so as to obtain a simultaneous operation of the two. Patent No. 169,623, granted December 26, 1882, to Hans Birkholz, for a "roller grinding-mill," is but a modified form of the first Gray patent, there being no patentable difference in the devices.—*Consolidated Roller-mill Co. v. Banard & Leas Manufg Co.*, Circuit Court of the United States, Northern District of Illinois, 43 Fed. Rep., 527.

**RECOVERY OF GOODS PURCHASED IN FRAUD.**—Where a merchant made purchases in May and June on credit secured upon untrue statements made either to the creditors themselves, or to the mercantile agencies upon which the creditors relied, when he was in fact insolvent, and where he testifies that in the latter part of June he knew he was insolvent, such purchases are fraudulent, and upon discovery of the fraud the sellers have the right to rescind the contract and recover the goods. If the goods have been sold to others, they can be recovered from them, so far as it can be shown that subsequent purchasers are not purchasers in good faith for value. That is, any one purchasing them with knowledge of the facts, and with knowledge that they had not been paid for, participated in the fraud, and has no rights to be protected.—*Grossman v. Waters*, Supreme Court of New York, 11 N. Y. Supp. 471.

**VALIDITY OF ASSIGNMENT FOR BENEFIT OF CREDITORS.**—A firm engaged in the mercantile business, being indebted in about the sum of \$18,000, for which A. B. & C. were separately liable as sureties for about equal portions of said debt, sold their stock of goods, including real estate and other property, to said sureties, who jointly assumed all the debts for which they were severally liable. This was a sale and not an assignment, and if made in good faith would be sustained. The sureties so far as appears, did not take the property for the benefit of one or more creditors of the debtor other than themselves, but they became absolutely liable for the debts which they had assumed, whether the property received was of sufficient value to pay said debts or not.—*Bonns v. Carter*, 20 Neb. 566; 31 N. W. Rep. 381, distinguished; *Kaufman v. Coburn*, Supreme Court of Nebraska, 46 N. W. Rep. 1010.

**THE CANADIAN GOVERNMENT.**—The Canadian Government has passed an order in council reducing to 2 cents a ton the tolls on wheat and other cereals passing through the Welland and St. Lawrence canals to Montreal or ports east. The order covers the coming season of navigation only and the concession applies to United States as well as Canadian bottoms.

## OUR BARGAIN WITH THE INVENTOR.

**A** UNITED STATES patent is a contract. The parties to it are the inventor on the one hand and the people of the United States on the other. The inventor, by a public record, informs the people concerning a useful discovery which he has made, which must be original with him and new in the United States. In return, the people, by their letters patent, secure to him the exclusive right to make, to use, and to sell his invention for a limited number of years. At the end of that period the contract terminates, and the discovery belongs to all the people forever. A patent, therefore, does not flow from the bounty of the community, a pension, or a subsidy, or a medal. It belongs to the inventor by right. It comes into existence in consequence of the legal establishment of a certain state of facts, namely, that the invention is new, useful and original with the claimant. This disclosure is the consideration on the part of the inventor, who, therefore, gives the community something of value which it did not before possess. The community gives to the inventor, not something of value which it already had, as where a part of the public domain is patented to a settler, but simply protection. If the invention is valuable, so is the protection; if the invention is worthless, the protection is without benefit; thus the contract is reciprocal and evenly balanced. The validity of a patent depends upon the maintenance of the facts established. To determine issues of validity is a function of the United States courts; to determine whether the consideration probably exists, and to make the contract itself, is the function of the United States patent office. "He who receives an idea from me," wrote Thomas Jefferson, "receives instruction himself without lessening mine; as he who lights his taper at mine receives light without darkening mine." An idea once made known is subject to human control only when incorporate, and therefore it can become the subject of patent only when it is tangible and existent. In the beginning it may be regarded as a marvel; in time it becomes a necessity of life, a manufacture, perhaps the basis of a great industry. In a certain sense the invention then detaches itself from the inventor; for the patent no longer protects only one man, but through him many men in their rights. The patent system of the United States has now completed its one hundredth year. The experience of the century shows that the advantages incident to the patent contract constitute a sufficient incentive, not merely to lead people to publish their inventions, but to make them invent. The number of patents granted yearly has steadily augmented; it is now more than 26,000, and is increasing. Under the fostering protection of patents we have developed, and are developing, inventors as a distinctive National product; and because of this we are enabled to exhibit to the world a growth and prosperity as a manufacturing people unexampled in the history of mankind. The patent contract secures to the inventor his right for a fixed period of time, absolutely and without limitation, save by the obligations which every man owes to society. It assumes that self-interest will best conduce to the development of the invention, and therefore it imposes on the patentee no recurring taxes, nor does it compel him practically to operate his

device. A patent grant is not made in payment for an invention, in the sense that one is a measure of value for the other, but in return for its disclosure. No one can assess the value of a new discovery to the human race for all time. The more important it is, however, the more incommensurate become the returns obtainable during the latent period. The millions made from the patents on the sewing machine, or the reaper and mower, or the telegraph, or the telephone, are utterly inconsiderable beside the enormous benefits which the public acquires through all futurity from these inventions. Whether the thing contrived is to underlie a great industry or whether it is merely an improved pin, the inventor, to be entitled to his patent, must disclose it fully, and without restriction or reservation; so that when the patent term shall be finished, the public may be able to make and use the thing as well as he himself can make and use it. He is entitled in return to equally full, unreserved and unrestricted protection. To lessen the enjoyment of that protection, or to limit it by harassing requirements, such as taxes or obligations to work the invention, as the opponents of the system have proposed, would amount simply to failure on the part of the people to comply with their side of the contract.—[Park Benjamin, in the *Forum* for March.]

**N**EWS.—P. J. SCHAPPS, the Albany, Minn., miller, has again been adjudged insane, and has been committed to the asylum at St. Peters. It is claimed by some parties that his commitment is the result of a conspiracy to defraud him of property, and there is much excitement over the matter in his neighborhood.

HOUSTON, Tex., is soon to have another 200-bbl. roller mill.

A MILL is to be erected at Union Hill N. Y., by Messrs. Baker & Co., at a cost of \$12,000.

H. S. GILBERT's elevator at Ottawa, Ill., burned April 16. Loss \$50,000 with light insurance.

DAYTON, Tenn.; Madison, Tenn.; Majorsville, W. Va.; and Waits, O.; are all to have new roller mills this year.

A FIRM in Centralia, Wis., recently purchased the flouring mills at Grand Rapids, Wis., from Nash Bros., of Milwaukee.

THE STILWELL & BIERCE MTG. CO., of Dayton, O., have the contract for building a 1,000-bbl. mill for Messrs. Marshall, Kennedy & Co., at Pittsburgh, Pa.

THE FARMERS in various parts of the country are negotiating with mill-builders for the erection of mills. This is good for the mill-builders, but —

W. M. HILLYER, a representative of an English syndicate, and G. J. Russell, of the Russell, Miller Milling Co., are in West Superior, with a proposition to build a great flouring mill on the water front to be operated in conjunction with an elevator system in North Dakota. The proposition involves the building of a mill of 5,000 barrels daily capacity.

JOSEPH PERRIEN, of Detroit, Mich., the wealthy miller who was kidnapped in so mysterious a manner March 18, returned home the following evening safe and well, but somewhat unnerved. He says that upon entering the coupe his suspicions were not aroused until he noticed the vehicle turn in the opposite direction to his friend's house.

He then threw open the door and attempted to jump out. He was met by two masked men, who held revolvers to his head and forced him back into the cab, they following. They then bound, gagged and blindfolded him, the cab keeping on what seemed its interminable course the while, under which circumstances Mr. Perrien was unable to keep any idea of locality in his mind. Finally he was removed from the cab to a room where his captors released him from his bonds, and covering him with revolvers, forced him to write the check, promissory note and letters. The latter were dictated from type-written copies in the hands of his captors, who remained masked and disguised. Mr. Perrien was not further disturbed till late that afternoon, when his captors informed him that their "game was up," but that they would "get him next time." He was then rebound, gagged and blindfolded and conducted from the room. Their course seemed to lay over a ploughed field, after pass-

ing which they entered a cab and another long, rough drive was commenced. At last Mr. Perrien was unloosed and thrust from the cab in a dazed condition and before he recovered himself the cab had departed. He boarded a Myrtle street car and went home, where he related the above story. His person was not harmed in any way. The valuables he had with him not being touched. He was furnished with good food and treated with consideration during his captivity. His story is considered as absolutely reliable and the police are making every effort to locate the perpetrators of the deed.

## TRADE NOTES.

THE J. B. Allfree Manufacturing Co., of Indianapolis, Ind., has just issued their new catalogue for 1891. It is very complete and all mill-owners should send for a copy for ready reference.

C. HOLCH, Wilton, Wis., will increase the capacity of his mill by placing a new water wheel of the improved Walsh Double Turbine Pattern, manufactured by B. H. & J. Sanford, Sheboygan Falls, Wis.

MESSRS. J. R. SECHLER & SON, Hixton, Wis., will soon improve their mill, by putting in a 48-inch improved Walsh Double Turbine Water Wheel and other machinery recently purchased from B. H. & J. Sanford, Sheboygan Falls, Wis.

THE ROBERT AITCHISON PERFORATED METAL CO., have removed their Chicago office from 76 Van Buren st. to 510 Boylston Building, Nos. 265-269 Dearborn st. This Company are doing a large amount of work for Milwaukee parties.

THE MILWAUKEE BAG CO. report business good for this season of the year. Competition has cut margins very materially in the bag line, but the Milwaukee Company are not only able to hold their old customers, but have added materially to their list of old ones.

THE EAST LEA PAPER CO., East Lea, Mass., after searching the country over for a high grade water wheel with a tight-fitting gate, to use their limited supply of water with the best possible economy, and after several unsuccessful tests of the leading wheels of eastern manufacture, have finally purchased an improved Walsh Double Turbine, of B. H. & J. Sanford, Sheboygan Falls, Wis., to meet their requirements.

## FOREIGN ITEMS.

Advices from Brazil report that the purchase of the entire plant of the Amazon steam navigation company by the Brazilian corporation, Empreza de Obrias Publias, has been completed. The purchase price is \$44,250,000, the first installment of which, \$500,000 has already been paid in Europe. This transfer from British to Brazilian hands of between 80 and 100 river steamers of all sizes, together with all offices, landings, etc., covers the entire basin of the Amazon river and its tributaries on more than 40,000 miles of navigation.

WE HEAR a dolorous tale from Constantinople! In the local milling industry ten years ago 24 mills were in full swing, now there are only 7, and the industry is still declining. The cause is simple. Import duties of flour are the same as on wheat, thus causing flour rather than wheat to be imported. Great discontent is naturally arising, and changes are likely to result from a recent agitation, which may lead to differential duties in favor of the miller.—*Liverpool Corn Trade News*.

AN ENGLISH JOURNAL is authority for the following: "A Belgian has recently invented, and had patented in this country, a curious idea in lucifer matches.

The invention consists in placing on different parts of the same match the two compositions which, used in ordinary safety matches, are commonly placed the one on the box and the other on one end of the match. When you want to "strike a light" with this new match you break it across the middle, and then rub the two ends together."

THE LATEST OFFICIAL RETURNS show a gratifying increase in the volume of trade between the United States and Mexico. A summary of the exhibits for the fiscal years ending June 30, 1890 and 1889, is as follows:

	IMPORTS.	EXPORTS.
1890.....	\$22,690,915	\$12,666,108
1889.....	21,253,601	10,886,288
INCREASE.....	\$1,437,314	\$1,779,820

CONSUL BAKER, while looking for an ultimate clearing up of the clouds that lower upon the Argentine Republic, yet regarded the immediate future with misgiving when he wrote, and said that the more careful of our merchants and manufacturers could be in filling orders, and the more emphatic they might be in refusing credits, the fewer losses they would incur, and the fewer bad debts they would have to transfer to the account of profit and loss. The merchants of the republic, he said, even the best of them were struggling under the weight of the bad business methods which they had been following. The only safe course for all parties, he continued, was to restrict orders to the sheerest necessities of trade, and instead of contracting additional obligations to liquidate in every possible manner those they might have outstanding.

VALUES OF FOREIGN COINS.—The Director of the mint has estimated, and the Secretary of the Treasury has proclaimed, the values of foreign coins to be followed in estimating the value of all foreign merchandise imported into the United States on and after April 1, 1891. The value of the following silver coins are changed from the value given them in the circular of January 1, 1891:

COINS.	VALUES.	
	Jan. 1, 1891.	1891.
Florin of Austria-Hungary.....	.381	.363
Bolizino of Bolivia.....	.771	.735
Peso of Central American States .....	.771	.735
Shanghai tael of China.....	1.139	1.085
Haikwan tael of China.....	1.270	1.209
Peso of Colombia.....	.771	.735
Sucre of Ecuador.....	.771	.735
Rupee of India.....	.366	.349
Dollar (peso) of Mexico.....	.837	.800
Sol of Peru.....	.771	.735
Rouble of Russia.....	.617	.588
Manbul of Tripoli.....	.695	.663
Bolivar of Venezuela.....	.154	.147
Yen of Japan .....	.838	.792

[Compiled for the UNITED STATES MILLER.]

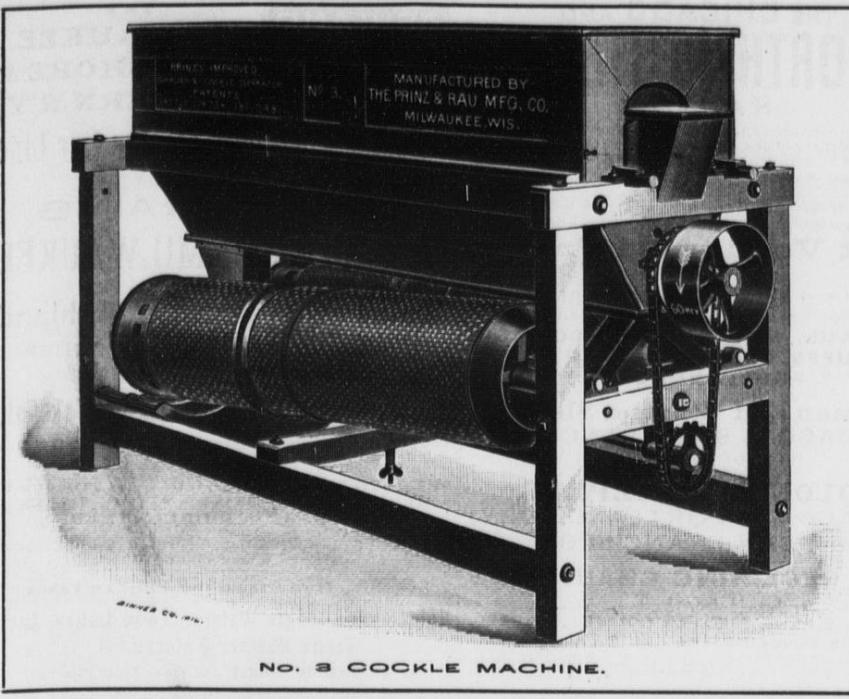
## MILLING AND MECHANICAL NOTES.

A THOROUGH application of red lead to iron and steel surfaces exposed to the weather, is said to be the best means of preventing rust.

THERE is nothing which will squelch an oil fed fire in its incipiency more quickly and effectually than sand—and there are no afterclaps in the way of water damage, either.

AN ENGINEER asks the following pertinent question: "Who should be the most competent to decide as to the condition of the boiler, the man who owns the boiler, or the man who cleans and cares for it?"

THERE is a natural law relating to belting which is not generally known, but which is nevertheless of value in practice. The hug or adhesion of a belt is as the square of the number of degrees which it covers on the pulley. For example, a belt that covers two-thirds of the circumference of a pulley requires four times the power to make it slip as it does when it covers only one-third of the same pulley.



# THE "PRINZ", PATENT IMPROVED COCKLE MACHINES

Immense increase of trade without traveling agents. OUR COMPETITORS GROSSLY ADVERTISING and imitating our STEEL REELS, we have decided to reduce our prices still more. Our Machines working satisfactorily in the following

## BIG MILLS IN MINNEAPOLIS:

Christian Bros. Mill Co.; Minneapolis Flour Mfg. Co.—Standard; Washburn Crosby Co.—"A" Mill; Pillsbury-Washburn Flour Mills Co.—Palisade; Sibley-Fletcher Holmes Co.—Northwestern Mills; Stamwitz & Schober—Phoenix; Hinkle, Greenleaf & Co.—Humboldt; D. R. Barber & Son; Pillsbury-Washburn Flour Mills Co.—Anoka Mill; Minneapolis Mill; Holly Mill; Zenith Mill; Pettit Mill.

## IN MILWAUKEE:

The Phoenix Mill; the Jupiter Mill; the Gem Mill; the Daisy Mill and the Duluth Mill.

TO BE SURE OF GETTING THE BEST MACHINE BUY THE GENUINE  
"PRINZ" IMPROVED STEEL COCKLE REEL.

WRITE FOR CIRCULAR AND REDUCED PRICE LIST TO

**THE PRINZ & RAU MFG. CO., MILWAUKEE, WIS.**

## MANUFACTURING SITES FOR SALE!

The undersigned owns a few of the *best* manufacturing sites in the city of Milwaukee, adjoining those now occupied by the *Milwaukee Car Wheel and Foundry Co.* and the magnificent plant of the *Fuller-Warren Stove Works* which cover nearly ten acres of ground. Best of railroad facilities. Parties desiring a suitable location should investigate this. Address,

**E. HARRISON CAWKER,**

36 & 37 Loan & Trust Building.

**MILWAUKEE, WIS.**

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OMENS IN A LOAF OF BREAD.—Among beliefs current with sailors is the belief that it is unlucky to turn a loaf upside down after helping one's self from it; the idea being that for every loaf so turned a ship will be wrecked. It is also said that if a loaf parts in the hand while being cut it bodes dissension in the family—the separation of husband and wife. Again it has been a widespread belief that the whereabouts of a drowned body may be ascertained by floating of a loaf of bread down the stream, when it will stop over the spot where the body is.

A curious account of a body thus discovered near Hull appeared some years back. After diligent search had been made in the river for a child, to no purpose, a twopenny loaf, with a quantity of quicksilver in it, was set floating from the place where the child

was supposed to have fallen in, which steered its way down the river upwards of half a mile, when the body happening to lie on the contrary side of the river, the loaf suddenly tacked about and swam across the river, and gradually sank near the child, and both the child and the loaf were brought up with the grapplers ready for the purpose.

A correspondent of *Notes and Queries* maintains it is a scientific fact that a loaf and quicksilver indicate the position of the body, as the weighted loaf is carried by the current just as the body is. This practice, too, prevails on the

Continent, and in Germany the name of the drowned person is inscribed on the piece of bread; while in France loaves consecrated to St. Nicholas, with lighted wax tapers in them, have generally been employed for that purpose.

## WANTED.

Position as traveling flour salesman in the Eastern states or cities. Applicant is a thoroughly well informed flour salesman and acquainted with the dealers and wants of the east.

Address "D,"

Care of UNITED STATES MILLER, Milwaukee, Wis.

## FOR SALE.

A roller-process flouring mill; 80 miles west of Baltimore; never-failing water power; capacity 300 bbls. a day; railroad at door, with shops, store-houses and dwellings. Address,

**R. D. MUSSEY, Lawyer,  
WASHINGTON CITY, D. C.**

## ENGINE AND BOILER FOR SALE.

A 25 horse-power Reynolds Corliss engine, with 40 horse-power boiler and heater and connections, all in first class condition and in use at present. To be delivered in May, 1891. A bargain for anyone in need of same. Reason for selling, more power required. For further information address,

**RIVERSIDE PRINTING & ENG. CO.,**

111 Grand Avenue, MILWAUKEE, WIS.

## FOR SALE In Wisconsin.

125-bbl. roller flour mill, 4 stories, frame with stone basement, including plenty water power for 4 water wheels. Flum-, dam and mill in good condition. Frame warehouse and office close by, and long sheds for farmers' teams. The whole property in full operation 16 hours daily, doing profitable business. Has big grist business. City of 2,000 population; two railroads. Good trade with citizens, farmers and lumbermen, for flour, feed and rye. Good local grain, and plenty of it. Good place to live, has good schools and churches, and close to other large cities. Owner non-resident, which is the reason for selling. Address,

4-tf MENASHA WOOD-SPLIT PULLEY CO., Menasha, Wis.

## FLOUR MILL FOR SALE.

### A RARE BARGAIN.

Following is a list of the machinery: One Schwartzwalder Scourer; one Victor Brush Machine; one Cockle Machine and Steam Wheat Heater; one 9x18 Double Chain Odell Roll; one 9x30 Double Odell Roll; Middling Stones; three Garden Bits and five Smith Purifiers; one Three Break Scalper and sixteen Flour Reels; three Fletcher and two "Silver Creek" Centrifugal Reels; two Richmond Bran Dusters; one Hughes Ship Stuff Duster; one Bran Packer; four Flour Packers; one Five Ton Platform Suspension Scale;

The above machinery is all of the latest improved, and has been run very successfully. Capacity of mill, twenty-four hours, 350 barrels. Driven by one 18x42 Reynolds' Corliss engine and one 180 H. P. Heine Safety Boiler. If desired, we will take pleasure in furnishing a more minute description, with price, terms, etc. The mill is situated on Fifth and Center streets, Little Rock, Ark. A bird's-eye view of Little Rock, showing location of mill, will be sent on application. For further particulars address,

**THE ARKANSAS PRESS, LITTLE ROCK, ARK.**

## THE APRIL MAGAZINE.

AN article in Harper's on "The Behring Sea Controversy," by the Hon. E. J. Phelps, ex-minister to the Court of St. James, is one of the most important journalistic achievements of the day. Gen. Lewal, ex-minister of war for France, writes for the same number a picturesque and entertaining account of the development of "The French Army," which is made still more attractive by a series of illustrations drawn by Thulstrup. T. Mitchell Prudden, M. D., in a paper amply illustrated by H. D. Nichols, gives some interesting "Glimpses of the Bacteria," and describes the influence which these microcosms have upon the life and health of other organisms. The popular series of South American papers by Theodore Child is continued in a timely illustrated article entitled "Argentine Provincial Sketches." A historical and descriptive paper on "The State Wisconsin," accompanied by numerous portraits of public men, is contributed by the Hon. William F. Vilas. Dr. Charles Waldstein writes a description of the famous Court Theater of Meiningen, and the duke of Saxe-Meiningen contributes to the illustration of the article some of his own pen-and-ink sketches. The fiction in this number includes the continuation of the serials by Charles Egbert Craddock and Thomas Hardy, and short stories by Margaret Crosby and Angeline Teal.

SCRIBNER's commences a richly illustrated series on "Ocean Steamships" which, it is believed, will be as successful as the "Railway" and "Electric" series. The most competent authorities have been chosen to write of "Ocean Passenger Travel," "The Ship's Company," "Safety at Sea," "Speed," and the "Lines of the World." Articles of travel and adventure are represented in this issue by Mr. Jephson's second paper on his perilous journey to relieve Capt. Nelson at Starvation Camp; Robert Gordon Butler's account of the cruise of the United States steamer *Thetis* to the Arctic regions; and Birge Harrison's description of a kangaroo hunt—a kind of sport which is now almost as rare in Australia as a buffalo hunt on the plains. The recent Sioux outbreak and the causes which produced it are clearly and dispassionately set forth by Herbert Welsh; and the Rev. Willard Parsons, its founder, tells the story of "The Fresh-Air Fund," which is entering on its fifteenth year. Other articles on practical charity are promised. The first of living Spanish poets is the subject of another article (with a portrait), and "What is Right-Handedness?" is discussed by Prof. Thomas Dwight of the Harvard Medical school.

DR. ALBERT SHAW may well be congratulated on his first American edition of *The Review of Reviews*. It shows a marked degree of improvement on any of the English editions both in the nature and arrangement of its matter and in the clearness of its text. It remains the busy man's magazine in every respect, reviewing in condensed form the progress of the world in politics, social reforms, the arts and sciences, giving to its readers information concerning the leading events of the day, and following with intelligent interest the movement of contemporary history. Its aim is to make the best thoughts of the best writers in contemporary periodicals of all nations universally accessible; to enable the busiest and poorest in the community to know the best thoughts of the wisest, and to understand something of the real character of the men and women who rank among the forces of the time. The office is at 52 Lafayette place, New York City.

THE country has for export without reducing its stocks lower than July 1, 1882, more than 47,000,000 bushels of wheat. During the month of March the movement has again been slow and scanty from Atlantic ports, and unless there is a marked change in that respect the available surplus for export will not be taken. These facts not only fail to sustain the extravagant pretensions of speculators, but fairly subject them to the criticisms which Mr. Dodge applies so freely. The so-called statistics manufactured for speculative consumption are generally of little value, but have been somewhat wilder and more foolish than usual this year.—*N. Y. Commercial Bulletin.*

ALL persons desiring to reach the entire milling and grain trade of America, by circular or otherwise, should obtain a copy of CAWKER'S AMERICAN FLOUR MILL AND GRAIN ELEVATOR DIRECTORY FOR 1890-91.

THE  
Cleveland, Cincinnati, Chicago & St. Louis  
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Sleeping Cars between

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The Only Line from Chicago running Solid  
Vestibule Trains into Central Union Depot,  
Cincinnati, where connection is made with  
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disagreeable transfers.Through Tickets via the Big Four Route can  
be procured at all Ticket Offices in the Northwest.O. G. MURRAY,  
Traffic Manager.D. B. MARTIN,  
Gen'l Pass'r Agent.

CINCINNATI, O.



This is not a puzzle, neither is it a theorem in geometry, it is merely intended to call attention to the fact that the **WISCONSIN CENTRAL LINES** form the direct route between Chicago and Milwaukee and the points named above. Through Fast Trains with Pullman Vestibuled Drawing Room Sleepers. Meals served in the "Central's" famous Dining Cars.

For tickets, Sleeping Car reservations, time tables, etc., apply at City Ticket Office, 9 Wisconsin Street, or at New Passenger Station, Fourth Ward Park.

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Under present arrangements Pullman sleeping cars and furnished tourist sleepers are run via the Wisconsin Central, and Pullman Palace Sleepers via the Chicago, Milwaukee and St. Paul, and Northern Pacific from Chicago through to the Pacific coast without change.

In addition to this service the Northern Pacific runs on its through express trains regular day coaches, dining cars and free colonist sleepers from St. Paul to Tacoma and Portland.

The Northern Pacific line allows the holders of second class tickets to stop at Spokane Falls, Wash., and at all points west thereof, ten days at each place desired. This will enable settlers to thoroughly examine all lands in the new State before selecting a permanent location. No other line offers holders of second-class tickets an opportunity of examining all sections of this great State without the payment of additional fares of from \$5.00 to \$20.00.

For Maps, Time Tables, and Illustrated Pamphlets, or any especial information desired, address your nearest ticket agent, or CHAS. S. FEE, Gen'l Pass. and Ticket Agent, St. Paul, Minn.

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Sunny South.

At no time in the history of southern travel have the indications pointed to so brilliant a season at the Winter Resorts of Florida and the South as is promised for 1890-91. At Jacksonville, St. Augustine, and along the Indian River extensive preparations have been made for the entertainment of northern guests, and all visitors can rest assured of the old-time hospitality for which the southern host is famous. With its customary enterprise, the Big Four Route, "The Great Florida Line," has placed on sale round-trip tickets at greatly reduced rates, and made special preparations to handle the southern tourist business. All persons contemplating a trip to Florida should ask for tickets via that popular line. Solid vestibule trains run daily between Chicago and Cincinnati, equipped with private compartment buffet sleeping-cars, and elegant parlor cafe dining-cars, lighted by gas and heated by steam, making direct connection in Central Union Depot at Cincinnati with through trains for all points in the South. Ask for tickets via the Big Four Route.

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Running Solid between Chicago and  
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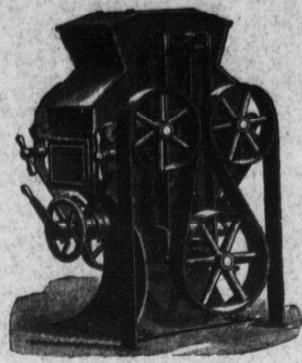
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4 ROLLER WHEAT MILL.

## Flour Mills.



## Corn Mills.



## Hominy Mills.

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Dear Sirs—In reply to yours, we have been running six weeks, and can say that your rolls are the best we have ever handled. They have not given us any trouble since we started, and the adjustments cannot be beaten, and the flour dressers and centrifugals are "daisies." They work just like a charm, and the cleaner and scalper do splendid work. They can not be beaten. All the other machinery, shafting, pulleys and everything is fitted up so nicely that there is no trouble to set it up. We can make fifty barrels of flour in 24 hours from No. 3 wheat. Our wheat is very poor and our flour is giving very good satisfaction, and The J. B. Allfree Co. is the best firm we ever had any dealings with. They did more than the contract called for. If we need any more machinery after this, they will get the order.

Yours very truly,

JENKINS & NEWBAUER.

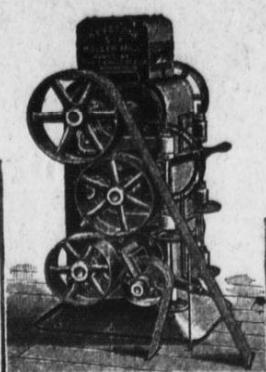
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THE J. B. ALLFREE CO., Indianapolis, Ind.:

Gentlemen—We have been running the mill you built here since February last, and can say we do not regret having given you the contract for rebuilding it for us. We thought our mill, which was burnt, a good one, but you have certainly improved on it, as we make a better clean-up if possible than the old one. Our flour compares favorably with that of other mills making four or five times as much low grade flour, and we are only making but two to three per cent with a very inferior grade of wheat. The machinery and workmanship is first-class throughout, and certainly requires as little power to run it as any mill of the same capacity.

Yours truly,

THE JAMESTOWN MILLING CO.

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THE KEYSTONE

6 ROLLER CORN MILL.

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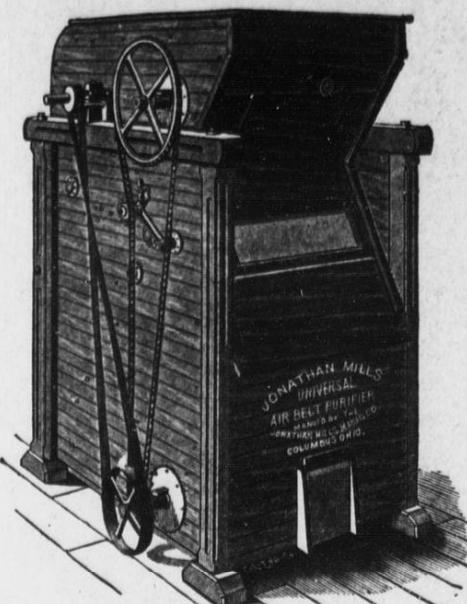
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Saves Power and Space. Yields Increased. Percentage of Patent Increased. Low Grades Decreased. All Grades of Flour Improved.

Requires no cloth, no dust house, nor dust catchers.

All grades of middlings perfectly purified with absolutely no waste.

In use in many of the representative mills in the country and being rapidly adopted in all sections by all classes and sizes of mills.

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Gents—On receipt of this, please send me another Jonathan Mills Air Belt Purifier, same as the ones heretofore sent. The more I use these machines, the better I like them. Our mill is so much cleaner than it ever was before, because we have no dust floating in the air, no waste whatever caused in the purifying process. Our middlings are absolutely perfect, and made so without waste and almost without power, the amount required to run the machines being so small. Respectfully yours,

HOMER BALDWIN.

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Dear Sirs—The writer arrived home a few days ago and found our Mr. Paine so enthusiastic over the Purifiers that he cannot rest night or day until he gets the rest of them. Thinks he will want six more. So please send them along as soon as possible. Let us know how soon we can expect them.

Yours Very Truly,

INDIANAPOLIS, IND., Feb. 5, 1890.

ACME MILLING CO., by S. F. Robinson, Pres.

THE JONATHAN MILLS MFG. CO.  
COLUMBUS, OHIO, U. S. A.

AFTER  
"THE TEST"



DUNLAP  
WAS CHOSEN.

WITNESSETH:

THE BRADFORD MILL CO., Cincinnati Ohio:

Gentlemen—Mr. Clark has just given me his order for the Dunlap Bolt, and wants it shipped as soon as possible. Make up and ship with the Bolt a Conveyor as per enclosed sketch. \* \* \*

AKRON, OHIO, September 23, 1890.

Respectfully,

FRANK E. NEAR.

OFFICE OF THE SEIBERLING MILLING CO.

THE BRADFORD MILL CO., Cincinnati, Ohio:

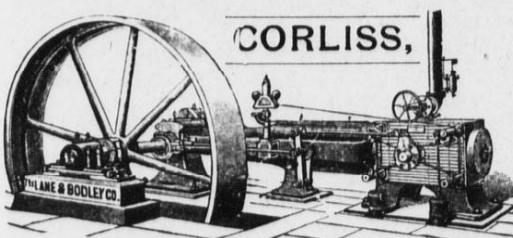
AKRON, OHIO, September 27, 1890.

Gentlemen—Yours of yesterday received, and I wired you this morning "yes," as per your instructions. The sketch is all right. Make the Conveyor good and strong.

I told Mr. Near that he need not have cloth sent with the Dunlap Bolt, as I have the one here that was used in the test. I will use same numbers on the new machine.

JAS. F. CLARK.

THE LANE & BODLEY CO.



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MANUFACTURERS OF  
AUTOMATIC CUT-OFF

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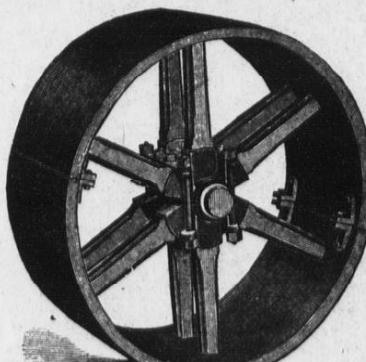
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Positively no leakage.  
Shipped on  
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More power with  
less water than  
any other wheel  
in the world.

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SHEBOYGAN FALLS, WIS.

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